

**UNITED STATES BANKRUPTCY COURT
DISTRICT OF PUERTO RICO**

In re:

THE FINANCIAL OVERSIGHT AND
MANAGEMENT BOARD FOR PUERTO
RICO,

as representative of

THE COMMONWEALTH OF PUERTO RICO,
et al.

Debtors.

PROMESA TITLE III

Case No. 17-BK-3283-LTS

(Jointly Administered)

In re:

THE FINANCIAL OVERSIGHT AND
MANAGEMENT BOARD FOR PUERTO
RICO,

as representative of

THE PUERTO RICO ELECTRIC POWER
AUTHORITY,

Debtor.

Case No. 17-BK-4780-LTS

**This Court Filing Relates Only to
PREPA and Shall be Filed Only in Case
No. 17-BK-4780-LTS and Main Docket
17-BK-3283-LTS**

EXPERT REBUTTAL REPORT OF THOMAS S. TERRY

May 15, 2023

TABLE OF CONTENTS

I. INTRODUCTION	4
II. QUALIFICATIONS	5
III. SUMMARY OF ANALYSIS AND OPINIONS.....	6
A. Basis for My Actuarial Analysis.....	6
B. Summary of My Opinions	6
IV. THE OVERSIGHT BOARD’S ACTUARY REFRAINS FROM ASSESSING THE REASONABLENESS OF THE ASSUMPTIONS AND METHODS THAT UNDERPIN THE PENSION CLAIM, THE PENSION RECOVERY, AND THE RECOVERY PERCENTAGE, THUS CALLING INTO QUESTION THEIR RELIABILITY	8
A. The reliability of actuarial calculations is inextricably linked to an actuary’s certification that they are reasonable.	8
B. The Oversight Board’s Actuary Sheva Levy refrains from attesting to the reasonableness of key actuarial assumptions and methods, thus calling into question the reliability of the Oversight Board’s calculations of the Pension Claim and the Pension Recovery.....	8
C. My Report is a Statement of Actuarial Opinion that can be relied upon.....	10
V. CORRECTLY CALCULATED, THE PENSION CLAIM IS \$2.616 BILLION, NOT \$3.955 BILLION AS STATED IN THE DISCLOSURE STATEMENT.....	11
A. The amount of the Pension Claim provided in the Disclosure Statement is overstated by \$1.339 billion.	11
B. \$407 million of the overstatement is attributable to the inappropriate inclusion of non-vested benefits.	11
C. There are inconsistencies concerning the administrative expense allowances built into the Oversight Board’s Pension Claim calculation. This would not modify the numbers, but I am including because it is an apparent flaw in the work by Ms. Levy.....	15
D. \$87 million of the overstatement is attributable to the inappropriate inclusion of extra amortization payments due to a funding lag.	18
E. \$546 million of the overstatement is attributable to the use of an inappropriate cash flow discount rate.....	20
F. \$299 million of the overstatement is attributable to use of an overly conservative discount rate assumption for pension funding.	23
G. Summary tabulation of the reasonable and appropriate Pension Claim of \$2.616 billion after correcting for the \$1.339 billion of overstatements.	24
VI. THE PLAN PROVIDES A RECOVERY OF BETWEEN 89% AND 95% OF THE CLAIM AMOUNT	26

A.	The Pension Recovery Percentage in the Disclosure Statement is understated.....	26
B.	The various Recovery Ratios calculated by the Oversight Board and shown in the Disclosure Statement contain flaws and inconsistencies.	26
C.	The Pension Recovery amount reported in the Disclosure Statement is overstated.....	28
D.	Despite Ms. Levy stating her most recent Recovery Percentage was [REDACTED] and evidence of a 94% Recovery Percentage, the Disclosure Statement still shows an 86% Recovery Percentage. The proper Recovery Percentage is either 89% or 95%, depending on which interest rate assumption is used for discounting.....	30
VII.	RESPONSE TO THE EXPERT REPORT OF JOSE FERNANDEZ	32
A.	Fernandez failed to take into account \$595 million in assets when setting his claim. This and other mistakes cause his claim to be overstated by \$936 million	32
B.	Correcting for Fernandez’s flaw claim amount, the Recovery Percentage would have been 95%.....	33
C.	Mr. Fernandez’s analysis of the Retirement System’s reform proposal is flawed and results in an inexplicable conclusion.	33
	APPENDICES.....	35
	Appendix A. Thomas S. Terry CV	
	Appendix B. Materials Considered in the Preparation of this Report	
	Appendix C. Data, Assumptions and Methods, and Plan Provisions	
	Appendix D. Development of Reasonable and Appropriate Pension Claim Cash Flows	
	Appendix E. Development of a Reasonable and Appropriate Interest Rate Assumption	
	Appendix F. Development of Reasonable and Appropriate Recovery Cash Flows	
	Appendix G. Participant Loan Repayment Schedule	
	Appendix H. Reliance on Models	

I. INTRODUCTION

1. I am the Chief Executive Officer of The Terry Group and I was retained as an expert in March 2023 by counsel for the Ad Hoc Group of PREPA Bondholders, Assured Guaranty Corp., Assured Guaranty Municipal Corp., and Syncora Guarantee Inc. (the “Bondholders”) concerning the Puerto Rico Electric Power Authority (“PREPA”) Pension Claim and Recovery.

2. I submit this rebuttal report in support of the Bondholders’ objections to confirmation of the Plan of Adjustment (“POA”) for PREPA based on the Disclosure Statement for the Modified Second Amended Title III Plan of Adjustment of the Puerto Rico Electric Power Authority dated March 1, 2023 (“Disclosure Statement”). I have been asked to review and analyze the amount of the Pension Claim reported in the Disclosure Statement, the amount of the Pension Recovery and the Pension Recovery Percentage reported in the Disclosure Statement, the Debtor’s Opening Expert Report and Disclosures (ECF No. 3418), the transcript of the Deposition of Sheva Levy and the Expert Declaration of Mr. José Fernandez.

3. Except as otherwise indicated, all facts set forth in this declaration are based upon my personal knowledge, my review of relevant documents and published reports, and my professional opinion. The analysis supporting my conclusions has been performed based on commonly used and widely accepted actuarial methodologies that are fully consistent with relevant U.S. Actuarial Standards of Practice.

4. If called upon to testify in this matter, I would testify competently to the facts and opinions set forth in this report. I reserve the right to supplement or revise my opinions in light of any additional information that may subsequently be made available to me, or if I am asked to perform further analysis.

II. QUALIFICATIONS

5. I am the Founder and Chief Executive Officer of The Terry Group, an actuarial and employee benefits consulting and research firm based in Chicago, Illinois.

6. I served as CEO and the top actuary at a succession of pension consulting firms since 1991: Chicago Consulting Actuaries (later named CCA Strategies); JPMorgan Compensation and Benefits Strategies; and, currently, The Terry Group. I and my firms have provided actuarial valuation and consulting services to numerous pension plan sponsors, including with respect to some of the largest, most complex pension plans in the United States.

7. I am past president (2014) of the American Academy of Actuaries, the national association for actuaries practicing in the United States. The Academy is the home of the Actuarial Standards Board, which sets standards for actuarial practice in the United States. I am also past president (2017) of the International Actuarial Association.

8. I am past vice president for pensions (2007-2009) of the American Academy of Actuaries. In that role, I also chaired the Pension Practice Council. The Council has responsibility for the Academy's pension policy work in the United States, as well as practice advancement for actuaries working in the pension field.

9. I served for five years (2008-2012) on the board of the Society of Actuaries, an education and research association that credentials actuaries and produces authoritative research on relevant actuarial topics.

10. I hold a Bachelor of Science in Math and Physics from Tufts University, and a Masters of Actuarial Science from the Graduate School of Business Administration at the University of Michigan. I am a Fellow of the Society of Actuaries, a Member of the American Academy of Actuaries, and an Enrolled Actuary.

11. Further details on my qualifications are included in my *curriculum vitae*, attached as Appendix A, which includes a list of expert testimony I have provided in the previous ten years.

12. I am being compensated for my work on this case at my hourly rate of \$950. I have been assisted on this matter by Terry Group staff members whose hourly rates range from \$395 to \$700. My charges are not dependent upon the substance of my opinions or testimony or the outcome of this matter.

III. SUMMARY OF ANALYSIS AND OPINIONS

A. Basis for My Actuarial Analysis

13. I and my team performed our actuarial analysis based on the information we have available. This information is included in Appendix B, Materials Considered in the Preparation of this Report. As indicated elsewhere in my report, I reserve the right to amend or supplement our analysis based on additional information that may become available. In particular, I have requested models, data and other information that would be helpful in my analysis that I have not received. Additionally, questions were asked in deposition to the Oversight Board's actuary, Ms. Sheva Levy, which Ms. Levy could not provide an answer or could provide only muddled answers. If new information becomes available, it is possible that some results or conclusions could change in either direction.

14. Where data or information was insufficient or entirely lacking, I made reasonable assumptions consistent with Actuarial Standard of Practice No. 23, Data Quality, and also Actuarial Standard of Practice No. 17, Expert Testimony by Actuaries.

15. While the Petition Date in this bankruptcy is July 2, 2017, for convenience, I have performed my actuarial analysis using a "claim valuation date" of June 30, 2017 – the "as of" date for pension asset reporting. This is the same approach taken by the Oversight Board¹ in their analysis of the Pension Claim.

16. The appendices include documentation of my actuarial analysis, including documentation and rationale for all actuarial assumptions to the extent not fully described in the body of my report.

17. My report and the actuarial conclusions herein, constitute a statement of actuarial opinion that I am qualified to make according to the U.S. Qualification Standards of the American Academy of Actuaries.

B. Summary of My Opinions

18. There are two main values relevant to determining the Recovery Percentage for the Pension Claim, as stated in the Disclosure Statement. The first is the Pension Claim itself, which is "the estimated present value of cash payments to be made by PREPA to the PREPA ERS under the PREPA ERS Regulations as of the Petition Date."² In other words, it is money that would be owed to PREPA ERS under the current laws and regulations. The second is the Pension Recovery. The Pension Recovery is the money that will be paid to the PREPA ERS under the Plan of Adjustment, after certain reforms are made to the PREPA ERS as described in the Plan of Adjustment.

19. In my expert opinion, the values estimated and disclosed by the Oversight Board are unreliable and fail to accurately capture the Pension Claim and the Pension Recovery. This

¹ The Financial Oversight and Management Board for Puerto Rico

² Disclosure Statement for Modified Second Amended Title III Plan of Adjustment, page 29.

report explains why these estimated values are unreliable (in Section IV), why the Pension Claim is overstated (in Section V), and why the Recovery Ratio is understated (in Section VI). Additionally, I explain why Sistema de Retiro de los Empleados de la Autoridad de Energia Electrica's (SREAEE³) erroneously inflates the Pension Claim (in Section VII). I provide a brief preview of my conclusions here.

20. **First Opinion.** The Oversight Board's Actuary refrains from assessing the reasonableness of the key assumptions and methods that underpin the Pension Claim, the Pension Recovery and the Recovery Percentage, thus calling into question their reliability.

21. **Second Opinion.** The reported Pension Claim of \$3.955 billion is overstated by approximately \$1.339 billion. Based on my calculations, the correct computation of the claim amount is \$2.616 billion. The Oversight Board has overstated the Pension Claim. The Board inappropriately included benefits that vest *after the Petition date*, included a "lag" in calculating funding payments which results in overfunding the plan, applied an incorrect discount rate as to future payments, and incorrectly assumed a too-low rate of return for Pension Assets.

22. In bankruptcy, the size of a pension claim can properly be thought of as a hypothetical "pot of money" such that, if it was provided to the pension system today, it would result in the pension system begin able to fully pay its obligations. The "pot of money" for PREPA ERS, when the Oversight Board's erroneous assumptions are corrected, is \$2.616 billion, meaning the claim is overstated by 51%.

23. **Third Opinion.** The Approximate Recovery of 86% reported in the Disclosure Statement⁴ is understated. Some of the same issues that plague the calculation of the Pension Claim are present in the Oversight Board's calculation of the Pension Recovery, resulting in a Recovery Percentage that is more generous than the Oversight Board predicts. I estimate that the actual Recovery Percentage proposed by the POA and Disclosure Statement is between 89% and 95%. If the Recovery Percentage was actually 86%, the recovery to the pensions would be \$2.250 billion.

24. **Fourth Opinion.** Finally, below, I also respond to the report of Mr. Jose Fernandez submitted on behalf of the SREAEE. Mr. Fernandez significantly overstates the Pension Claim due to numerous issues including (among others) the failure to account for \$595 million in pension funding at his chosen measurement date. His faulty calculations on the size of the Claim should not be relied upon.

³ For sake of clarity I will refer to the party representing the Pension System as SREAEE. I will refer to the Pension System itself as PREPA ERS.

⁴ Disclosure Statement for Modified Second Amended Title III Plan of Adjustment, page 29.

IV. THE OVERSIGHT BOARD’S ACTUARY REFRAINS FROM ASSESSING THE REASONABLENESS OF THE ASSUMPTIONS AND METHODS THAT UNDERPIN THE PENSION CLAIM, THE PENSION RECOVERY, AND THE RECOVERY PERCENTAGE, THUS CALLING INTO QUESTION THEIR RELIABILITY

A. The reliability of actuarial calculations is inextricably linked to an actuary’s certification that they are reasonable.

25. The American Academy of Actuaries,⁵ through its Code of Professional Conduct, issues “Qualification Standards for Actuaries issuing Statements of Actuarial Opinion in the United States.”⁶ These standards define a “Statement of Actuarial Opinion” as an opinion expressed by an actuary about an actuarial calculation upon which others rely:

“... a Statement of Actuarial Opinion” (SAO) is an opinion expressed by an actuary who is subject to the *Code of Professional Conduct* by virtue of membership in a U.S.-based actuarial organization, where such opinion is expressed in the course of performing Actuarial Services and intended by that actuary to be relied upon by the person or organization to which the opinion is addressed.⁷

26. The Oversight Board has put forth a multibillion dollar Pension Claim and a multibillion-dollar Pension Recovery that are based on complex pension actuarial calculations. These calculations must be accompanied by a Statement of Actuarial Opinion in order to be considered reliable.

27. Reasonability and reliability are inextricably linked and are central elements of the profession’s Actuarial Standards of Practice (“ASOPs”). Thus, values (e.g., the value of a pension claim or of a pension recovery in a bankruptcy) derived from actuarial calculations are deemed reliable if the underlying assumptions, methods and models are deemed reasonable by a Qualified Actuary.

B. The Oversight Board’s Actuary Sheva Levy refrains from attesting to the reasonableness of key actuarial assumptions and methods, thus calling into question the reliability of the Oversight Board’s calculations of the Pension Claim and the Pension Recovery.

28. I have seen no evidence of support by the Oversight Board or Ms. Levy for the reasonableness of the assumptions or methods used to calculate the Pension Claim or the Recovery amount, nor any rationale for the selection of those assumptions.

⁵ The American Academy of Actuaries (the Academy) is the national association for actuaries practicing in the United States. The Academy is the home of the Actuarial Standards Board (ASB), which sets standards for actuarial practice in the United States.

⁶ Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States, Effective January 1, 2022.

⁷ Ibid, page 1.

29. Ms. Levy developed the \$3.955 billion Pension Claim⁸ amount that was reported in the Disclosure Statement.⁹

30. Despite being involved with the Oversight Board since 2019,¹⁰ Ms. Levy acknowledges in her work product and in her deposition that she did not evaluate any of the assumptions or methods for reasonableness.

31. Ms. Levy testified that all assumptions used in her work product were prescribed by the Oversight Board and were not assessed for reasonableness. The following disclaimer can be found in the work product for the \$3.955 billion claim – a document that that Ms. Levy testified was “wholly produced”¹¹ by her and her team:

[REDACTED]

32. As Ms. Levy testified in her deposition, she is not providing any actuarial opinion whatsoever on the appropriateness of the actuarial assumptions, including the highly relevant expected return on assets of 5.75%.¹³

Question: So, for example, the discount rate [REDACTED], actuarially determines contribution ADC 5.75 percent, that was a rate that was prescribed by the board?

Answer: Yes.

Question: And that was a rate that you did not take steps to independently determine the reasonableness of?

Answer: Correct.

33. Ms. Levy’s work product also documents the Oversight Board’s use of a present value discount rate of 3.58% -- used in part to determine the Pension Claim and the Pension Recovery. [REDACTED]

⁸ Levy deposition, 46:8-17

⁹ Levy deposition, 49:5-15]

¹⁰ Levy deposition, 11:8-10

¹¹ Levy deposition, 46:8-17

¹² PREPA Pension Claim and Recovery January 27, 2023 and Levy deposition, 50:21-51:4

¹³ Levy deposition, 53:13-22



34. Further, as Ms. Levy testified in her deposition, she is not providing any actuarial opinion whatsoever on whether or not it is appropriate to use the Entry Age Normal actuarial cost method¹⁵ to calculate the value of the Claim.¹⁶

Question: You are not giving an opinion on the appropriateness of using entry age normal as the actuarial funding method; right?

Answer: Correct.

35. Refraining from rendering reasonableness opinions or from even undertaking a reasonableness assessment of relevant assumptions and methods, despite the actuary's multiyear engagement with the Oversight Board, calls into question the reliability of the Oversight Board's actuarial calculations of the Pension Claim and Recovery.

C. My Report is a Statement of Actuarial Opinion that can be relied upon.

36. The estimation of the Pension Claim and the Pension Recovery amount are actuarial calculations. These calculations demand a careful understanding of pension plans and the principles of pension finance, and involve several important actuarial considerations.

37. I have considered, and attest to, the reasonableness of the assumptions and methods used in my actuarial calculations. Where data was not available, I made efforts to adjust available data with reasonable proxies.

38. Documentation of my actuarial calculations and all relevant assumptions are included in the appendices to this report.

39. My work has been conducted in accordance with the Actuarial Standards of Practice (ASOPs), and I list the relevant ASOPs I considered in the Appendix.

40. I meet the Qualification Standards of the American Academy of Actuaries to render the various opinions included in my report.

¹⁴ PREPA Pension Claim and Recovery January 27, 2023, Appendix E.

¹⁵ I address the relevance of the Entry Age Normal actuarial cost method later in my report.

¹⁶ Levy deposition, 106:15 – 19

V. CORRECTLY CALCULATED, THE PENSION CLAIM IS \$2.616 BILLION, NOT \$3.955 BILLION AS STATED IN THE DISCLOSURE STATEMENT

42. The Disclosure Statement provides a purported value for the Pension Claim in the amount of \$3.955 billion. Based on documents provided by the Oversight Board and testimony provided by Ms. Levy, this figure was calculated by Ms. Levy based on a series of assumptions and instructions provided by the Oversight Board that are not appropriate for the measurement of the Pension Claim.

A. The amount of the Pension Claim provided in the Disclosure Statement is overstated by \$1.339 billion.

43. In my opinion, the Disclosure Statement's Pension Claim of \$3.955 billion is overstated by approximately \$1.339 billion. My calculation of the proper Pension Claim amount is \$2.616 billion. The Oversight Board has overstated the Pension Claim amount by 51%.

44. The overstatement is caused by these four flaws in the Disclosure Statement's Pension Claim:

- The inappropriate inclusion of non-vested benefits in the claim determination accounts for \$407 million of overstatement.
- The inappropriate inclusion of extra amortization payments when the pension plan is projected to be overfunded due a funding lag accounts for \$87 million of overstatement.
- The inappropriate use of an industry report to choose a cash flow discount rate accounts for \$546 million of overstatement.
- The inappropriate dismissal of a reasonable expected rate of return accounts for \$299 million of overstatement.

45. I describe each of these elements of the overstatement, as well as my corrections, in the following sections.

B. \$407 million of the overstatement is attributable to the inappropriate inclusion of non-vested benefits.

A pension claim in bankruptcy should be the value of the vested, accrued benefit as of the claim valuation date.

46. According to the Disclosure Statement all permanent full-time employees of PREPA are eligible to participate in a defined benefit pension plan (the "plan") administered by the Employees' Retirement System ("ERS") of PREPA. The defined benefit plan provides

retirement and termination benefits to plan participants as well as death, disability, and survivor benefits.¹⁷

47. As an actuary, I understand that in bankruptcy where the focus is on the right to payments,¹⁸ the right to pension payments is established by the terms of the pension plan. Employees must satisfy all conditions for receiving pension benefits according the terms of the plan in order to earn the right to future pension payments. It follows that employees who have not satisfied all conditions for receiving pension benefits have not yet earned the right to receive pension payments, but may be able to earn such a right in the future if they continue to work for the employer.

48. I use the term “claim valuation date” to denote the point in time at which one can determine employees’ vested rights to pension benefits.

49. Ordinarily, pension benefits are considered to be “career benefits” that are earned fully over an employee’s career. A bankruptcy claim, however, “freezes” that process. It is most appropriately thought of as the benefit to which the employees have a vested right as of a claim valuation date, which is often on or close to the petition date.¹⁹

Career Benefits	Vested Accrued Benefits at a Claim Valuation Date
Projected to retirement	Accrued at a point in time
Past service plus future projected service	Past service only
Projected pay at a future retirement date	Past pay only
Rights to benefits based on age and service at retirement	Rights to benefits based on age and service at the claim valuation date

The appropriate measurement methodology for a pension claim in a bankruptcy is the unit credit method, not the entry age normal method.

50. There are two general types of methods for valuing pension plan liabilities. One is based on projected benefits and the other is based on accrued benefits. The purpose of the measurement will determine the appropriate measurement methodology.

Projected benefit actuarial cost methods	Accrued benefit actuarial cost methods
Based on career benefits projected to retirement	Based on accrued benefits at a point in time, such as a claim valuation date in a bankruptcy

¹⁷ Disclosure Statement for Modified Second Amended Title III Plan of Adjustment, page 80.

¹⁸ US Code Title 11 Section 101(5) “The Term “claim” means (A) right to payment, whether or not such right is reduced to judgement, liquidated, unliquidated, fixed, contingent, matured, unmatured, disputed, undisputed, legal, equitable, secured, or unsecured; or (B) right to an equitable remedy for breach of performance if such breach give rise to a right to payment, whether or not such right to an equitable remedy is reduced to judgement, fixed, contingent, matured, unmatured, disputed, undisputed, secured, or unsecured.”

¹⁹ In this case, the claim valuation date is June 30, 2017. This is consistent with the work of the Oversight Board. PREPA Pension Claim and Recovery January 27, 2023, Claim and Recovery as described in Appendix E.

Used for long term funding decisions for an ongoing plan	Used for plan terminations, bankruptcy claims, and other point-in-time measures ²⁰
Values what needs to be in the plan at retirement	Values what needs to be in the plan today for what has already been earned
Going concern perspective	“Up to now” perspective

51. An example of a projected benefit actuarial cost method is the entry age normal method. Using this method, an actuary projects all future benefits, including future service and pay, and allocates the value of those future benefits across all years, past and future. At any point in time, the amount attributable to past versus future service is an allocation. Allocation merely reflects rules defined by the cost method, not necessarily the benefits the participants have actually earned. Different allocation methods result in differences between what is allocated to the past and to the future.

52. An example of an accrued benefit actuarial cost method is the unit credit method, which relies on actual accrued benefits as of a point in time, not an allocation method which relies on employees’ ultimate benefits at some future retirement date. The unit credit method only includes the vested portion of each individual’s benefit.

53. The unit credit actuarial cost method is, in my opinion, the appropriate method to use to measure a pension claim in a bankruptcy in which we are not trying to value future benefits, but only the already-accrued right to payment. It is clear when using the unit credit method that the accrued benefit value includes only vested benefits and similarly, does not include non-vested benefits.

Entry age normal method	Unit credit method
A projected benefit actuarial cost method	An accrued benefit actuarial cost method
Reliant on many assumptions about future pay and service	Reliant only on past pay and service determined at a point in time

54. ASOP No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions, is the definitive practice standard for an actuary to measure pension obligations. A key consideration is the purpose of the measurement.²¹

55. The reason the entry age normal method is inappropriate for measuring a pension claim in bankruptcy is that its calculations are dependent upon both benefits that are vested and benefits that are non-vested. Specifically, the liability calculated under the entry age normal method will always include certain benefits based on future service that has not been performed, benefits based on future compensation that has not been earned, and benefits to which employees are not yet eligible because they are not yet vested. In short, in this case the liability at the

²⁰ In a similar situation where a private sector employer declares bankruptcy and the Pension Benefit Guaranty Corporation (PBGC) takes over an underfunded pension plan, PBGC only guarantees nonforfeitable benefits (i.e., vested accrued benefits) as of the bankruptcy filing date (see 29 CFR 4022.3 and 29 CFR 4022.4). The valuation of vested accrued benefits is done using the unit credit actuarial cost method.

²¹ Actuarial Standard of Practice No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions, Section 3.3.

petition date is a function of the employee pay and service through *all years* after the petition date. Individuals are only valued to the extent that they have claim to a pension on the petition date.

56. Where projections of future pay and service are irrelevant, as in a bankruptcy claim, the actuary should use an accrued benefit actuarial cost method, such as the unit credit method.

57. The overstatement in the Disclosure Statement of the Pension Claim caused by inappropriately including non-vested benefits and by the inappropriate use of the entry age normal actuarial cost method is \$407 million. Details are provided in Appendix D.

Ms. Levy Acknowledges Employees Hired after Petition Date Add to Claim

58. The deposition testimony of Ms. Levy confirmed that in calculating the Pension Claim, the Oversight Board improperly included future salary, future service, and future hires, thus inflating the Pension Claim.

59. For example, Ms. Levy acknowledges the Actuarially Determined Contributions (“ADCs”) found in Column A of the “PREPA Pension Claim and Recovery” Document,²² which themselves are the basis of the calculation of the \$3.955b Claim,²³ include employees hired after the petition date. As an example, Ms. Levy was asked about her calculation of the 2023 ADC of [REDACTED].²⁴

Question: So for your calculation for 2023 of [REDACTED], that presumes a new hire post July 1, 2017 as well; right?

Answer: Yes.

Ms. Levy Acknowledges Additional Salary and Service Beyond Measurement Date Adds to Claim.

60. When asked about her calculation for 2024, Ms. Levy acknowledged that part of the [REDACTED]²⁵ ADC is attributable to future salary increases that both occur after 2024 and occur long after the Claim date of June 30, 2017.²⁶

Question: And likewise, what you did for 2024 and on, it is likewise attributable part of -- part of the ADC is attributable to the future salary increases that are presumed to occur?

Answer: Yes.

²² PREPA Pension Claim and Recovery January 27, 2023, page 2.

²³ Ibid.

²⁴ Levy deposition, 115:24-116:4.

²⁵ PREPA Pension POA Savings Estimates February 8, 2023 with exhibit 6 appended April 26, 2023, Exhibit 2.

²⁶ Levy deposition, 115:12-17.

61. When asked about her calculations more generally, Levy admits that the ADC in a given year is impacted by the future service performed.²⁷

Question: Well, from 2017 – let’s do one year at a time. The numbers for 2018 presume that at least some of the employees are going to continue in 2019; right?

Answer: The actuarial liability that’s used in the ADC calculation requires knowing how many years of service are assumed for an individual in the future.

C. There are inconsistencies concerning the administrative expense allowances built into the Oversight Board’s Pension Claim calculation. This would not modify the numbers, but I am including because it is an apparent flaw in the work by Ms. Levy.

62. Clearly, there will be administrative expenses, the money needed to administer PREPA ERS, associated with calculating and paying the benefits obligated in the Pension Claim. The Disclosure Statement’s measure of the Pension Claim includes an “administrative fee load” of [REDACTED]²⁸ This means that the Pension Claim includes a provision for annual administrative expenses equal to [REDACTED]

63. Based on the information provided to me to date, there is no factual justification for the [REDACTED] administrative fee load. . It far overstates the costs of effectively running a pension system.

64. The reasonableness of this assumption is best assessed by looking at the rate of expenses in recent years.

65. The table below shows, for the years 2016 to 2019, the level of expenses implied by the Disclosure Statement’s [REDACTED] assumption and compares that to the actual level of expenses reported in Cavanaugh Macdonald’s 2019 actuarial report.²⁹

²⁷ Ibid, 116:17-117:2.

²⁸ PREPA Pension Claim and Recovery report dated January 27, 2023, Appendix B: Assumptions.

²⁹ Employees' Retirement System of Puerto Rico Electric Power Authority Report on the Seventy-Second Actuarial Valuation as of June 30, 2019, August 6, 2020, page 5.

Disclosure Statement's [REDACTED] expense load assumption, if applied historically to benefit payments for 2016 to 2019, unreasonably overstates the level of actual expenses.

Year	Annual Benefit Payments	Annual Expenses		Actual Percentage
		[REDACTED]	Actual	
2019	\$277,263,390	[REDACTED]	\$274,652	0.10%
2018	\$274,818,013	[REDACTED]	\$260,280	0.09%
2017	\$269,178,338	[REDACTED]	\$229,675	0.09%
2016	\$255,847,034	[REDACTED]	\$315,139	0.12%

66. The pattern of actual expenses observed in recent years shows that a reasonable and appropriate expense assumption is 0.1%, not [REDACTED].

67. In her deposition testimony, Ms. Levy states that the administrative expenses in the new PayGo+³⁰ system set up by the Plan of Adjustment to fund PREPA ERS pension benefits are higher due to certain circumstances unique to that system.

68. Ms. Levy states that she is aware that the PayGo+ system of the Oversight Board's pension reform proposal would be more expensive to administer than the existing PREPA ERS program (the prior program being referenced below).³¹

Question: Are you aware of any reason why the PayGo system, PayGo Plus system would cost more to administer were than the prior system?

Answer: Yes.

69. Ms. Levy then identified three reasons that the PayGo+ system is more expensive than the PREPA ERS program.³²

Answer: The PayGo Plus system would involve reviewing the benefits paid by PREPA ERS to confirm that they're consistent with the plan of adjustment to be then eligible for reimbursement. The PayGo Plus structure would require some estimate of the contributions needed under the plan of adjustment which are different from how the contributions are currently determined. And since this is a separate trust, those assets would need to be managed in addition to the assets

³⁰ PayGo+ is the proposed new trust and system set up under the Disclosure Statement for Modified Second Amended Title III Plan of Adjustment. In the PayGo+ trust, the Pension Plan has no long-term assets. Instead, PREPA contributes to the PayGo+ trust on an annual basis, and then the PayGo+ trust reimburses PREPA ERS for the required benefit payments.

³¹ Levy deposition, 135:13-17]

³² Ibid, 133:9-24.

-- the costs of PREPA ERS managing their own assets. Those are the costs that come to mind that don't currently exist.

70. [REDACTED]

Question: Is the [REDACTED] administrative fee load included within the computations included in Column A?

Answer: To my knowledge, yes.

Question: And it's on an annual basis; right?

Answer: Yes.

Question: And that's for each year from 2018 through 2060?

Answer: Yes.

71. [REDACTED]

72. [REDACTED]

would be a wholly unnecessary inclusion of the administrative expenses associated with the PayGo+ funding vehicle in the determination of Pension Claim where the PayGo+ system does not exist.

73. Except for the above testimony, the documentation and testimony I have reviewed provide no alternative administrative expense load, and so I have assumed 0.1% of benefit payments as the administrative expense load for the purposes of determining Pension Claim. However, if additional information comes to light, it could cause me to adjust my computations. I have requested the underlying models to confirm this but have not received them.

³³ Ibid, 126:15-24.

³⁴ PREPA Pension Inputs Discussion January 5, 2023, page 3.

74. I reserve the right to amend this portion of my report upon the discovery of any data or additional information that is able to resolve the inconsistency between the deposition testimony noted above and the documentation I have been provided.

D. \$87 million of the overstatement is attributable to the inappropriate inclusion of extra amortization payments due to a funding lag.

75. The Disclosure Statement's Pension Claim is based on a flawed projection of employer contributions. Under the Oversight Board's figures, the PREPA ERS would be projected to be fully funded by some time in 2040, however the Oversight Board does not stop contributions as of that date. Instead, the flawed approach upon which the Pension Claim is based builds in an overstated contribution for 2040 and a completely unnecessary contribution for 2041.

76. The overstatement occurs because the flawed projection fails to adjust for the fact that the normal PREPA process for funding the plan has a built-in delay. When PREPA's actuaries calculate an ADC, that ADC amount isn't actually contributed right away. Instead, it is contributed in the fiscal year two years later than the year for which it was calculated – effectively ignoring any contributions made in the interim.

77. In the normal course of “going concern” pension plan financing—that is, a pension plan that is assumed to exist indefinitely—this nuance is not significant. However, for purposes of measuring the Pension Claim, which anticipates a single, finite amortization payment period that ends in 2039-2040, it *is* significant. The “going concern” modeling at the end of the amortization period can lead to tacking on additional contributions that simply are not needed to fully amortize the liability – and the result is a Pension Claim that inappropriately anticipates “over-funding” the pension plan.

78. In my opinion, it is inappropriate for the Pension Claim to anticipate “overfunding” the plan at the end of the amortization period. The overstatement of the Pension Claim in the Disclosure Statement caused by this modeling flaw is \$87 million. Details are provided in Appendix D.

79. Testifying in her deposition, Ms. Levy appears to agree in principle that it is not appropriate to overfund the pension plan in this context, yet in her calculations that appears to be exactly what she has done.

80. Ms. Levy agrees that the objective in funding the claim amount is to target a 100% funded ratio.³⁵

Question: And the objective for the claim amount calculation is not to be overfunded; it's to be 100 percent; right?

Answer: Yes.

³⁵ Levy deposition, 146:16-20.

81. Ms. Levy further agrees that a revision should be made where the ADC results in a funded ratio exceeding 100%.³⁶

Question: And so if the calculation of ADC ended up above 100 percent, that would indicate that a revision should be made, so that does not occur in a hypothetical scenario?

Answer: In a hypothetical scenario.

82. I believe that Ms. Levy is indeed projecting to overfund the plan, but is attributing this to being consistent with Cavanaugh Macdonald's approach to determining ADC. In other words, the Oversight Board adopted the PREPA ERS's calculation method without thinking through the different purposes behind those methods. See the following note contained within Levy's materials:³⁷

[REDACTED]

83. When discussing the Cavanaugh Macdonald method, Ms. Levy further clarified this as follows:

And the plan asset amount does not include any contributions associated with the prior year's ADC and that is to be consistent with the approach followed by the other actuaries who have determined the ADC.³⁹

84. I see the result of this alleged consistency in the March 8, 2021 Cavanaugh Macdonald LUMA study.⁴⁰ This report decisively shows that Cavanaugh Macdonald's own method of determining ADCs results in a projected funded status of over 100% at June 30, 2040 and worse – a projected funded status that increases significantly by fiscal year end 2041.

85. Although this method of not including the prior year's ADC (meaning the one calculated in the prior year, but payable in a subsequent year) may be reasonable for an ongoing pension funding schedule, it is inappropriate during its last year of amortization. When a pension plan approaches the last two years of an amortization schedule, additional care is needed to ensure that contributions do not result in the overfunding of the plan.

³⁶ Ibid, 146:21-147:2.

³⁷ PREPA Pension Claim and Recovery January 27, 2023, Appendix B.

³⁸ Levy deposition, 66:15-19

³⁹ Ibid, 141:10-15.

⁴⁰ Cavanaugh MacDonald 2021 LUMA Study, March 8, 2021 (235915 - Cavanaugh MacDonald 2021 LUMA Study.pdf.pdf).

E. \$546 million of the overstatement is attributable to the use of an inappropriate cash flow discount rate.

Background on the Oversight Board's selection of the 3.58% discount rate

86. A discount rate of 3.58% is used in the Oversight Board's claim and recovery for the purpose of calculating the present value of cash flows occurring in the future. With respect to the determination of the Pension Claim, this discount rate applies to the present value of the future ADCs. With respect to the determination of the Pension Recovery, this discount rate applies to the present value of the future PayGo+ reimbursements to PREPA ERS. The purpose of calculating the present values using the discount rate is to provide comparability between these two different values – including the calculation of a Pension Recovery Percentage.

87. [REDACTED] is there any indication that Ms. Levy has assessed this assumption for reasonableness as part of her analysis.

88. In choosing a discount rate, a key consideration for the actuary is the purpose or intended use of the calculations to be performed using the rate.

89. Here, a document entitled "PREPA Pension Inputs Discussion," dated January 5, 2023 ("PREPA Pension Inputs document")⁴³ [REDACTED]. In her deposition, Ms. Levy stated that the 3.58 rate was based on the [REDACTED]:

Question: Do you have an understanding of why a 3.58 discount rate was used for purposes of the claim recovery calculations?

Answer: My understanding is the board wanted to use a rate that was [REDACTED]

90. In her deposition, Ms. Levy confirms that she did not assess this 3.58% discount rate as being reasonable:⁴⁴

Question: And EY didn't vet or determine that that choice [3.58%] was reasonable or unreasonable; right?

Answer: I did not.

⁴¹ PREPA Pension Claim and Recovery January 27, 2023, Appendix A.

⁴² Ibid, Appendix E.

⁴³ PREPA Pension Inputs Discussion January 5, 2023, page 4.

⁴⁴ Levy deposition, 163:5-8.

Ms. Levy's use of the [REDACTED] was a faulty application of the report's recommendation.

91. This represents a faulty application of the [REDACTED] recommendation to the task at hand, which was to choose a discount rate for the purposes of calculating the Claim and Recovery amounts. [REDACTED]

92. Ms. Levy, in her January 5, 2023 Pension Inputs document, [REDACTED]

[REDACTED]
46

93. But this quote omits relevant context for which the [REDACTED] offered this recommendation. Directly preceding the passage⁴⁷ that the Oversight Board relied upon is the following sentence which makes it clear that [REDACTED] (emphasis added):

[REDACTED]
48

94. The 3.58% interest rate is used in the context of comparing different pension-related cash flows in the Plan of Adjustment, not in the context of funding calculations.

The Actuarial Standards of Practice issued by the Actuarial Standards Board are the only authoritative guidance for actuarial calculations.

95. [REDACTED] is not authoritative guidance for actuaries. The Actuarial Standards Board considered the recommendations in [REDACTED], but the report's recommendations ultimately were not adopted nor incorporated into the ASOPs.

The Oversight Board's selection of the 3.58% interest rate is inconsistent with its own rate of PREPA's borrowing costs in 2017.

96. The PREPA Pension Inputs document reflected various other considerations, such as the municipal bond index, Puerto Rico's borrowing cost, GASB's accounting interest rates or the "explicit risk premia." [REDACTED]

⁴⁵ PREPA Pension Inputs Discussion, January 5, 2023, page 4.

⁴⁶ Levy deposition, 154:22 – 155:16

⁴⁷ [REDACTED]

⁴⁸ Ibid.

[REDACTED] But when asked in her deposition about these other possible inputs Ms. Levy said that she neither performed any analyses based on these considerations nor had knowledge of how these considerations were applied by the Oversight Board in the selection of the 3.58% interest rate.⁴⁹

97. Nevertheless, the PREPA Pension Inputs document states that [REDACTED]
[REDACTED]⁵⁰ This, too, was not analyzed by Ms. Levy, who testified that she did not examine the actual “cost of funds for Puerto Rico” (or PREPA) in 2017.⁵¹ Nor did Ms. Levy examine the interest rate of Series-B bonds contemplated under PREPA’s Plan of Adjustment (which at least would reflect some measure of actual cost of funds to PREPA as of 2023).⁵² And, notably, the Oversight Board’s own analysis in the Estimation Proceeding reflects the selection of 6.5% discount rate for the cost of capital in 2017 – a far cry from the 3.58% used by the Oversight Board in its pension analysis.⁵³

5.45% is the most appropriate rate for comparing the values of different pension-related cash flows in the Plan of Adjustment.

98. In my view, the most appropriate interest rate for the purpose of comparing the values of different pension-related cash flows in the Plan of Adjustment is 5.45%.

99. The cost of funds interest rate is well established in finance for managing and allocating resources to different uses and is mentioned as a consideration [REDACTED]
[REDACTED]⁵⁴

100. Here, the interest rate used by the Oversight Board in Series B Bonds – as well as in other calculations in PREPA’s Plan of Adjustment – is 6.00%, which was determined in 2023. Using that same interest rate would ensure comparability and not cause one present value to be larger than other present values merely because different interest rates are selected.

101. However, the 6.00% should be adjusted to account for the fact that the calculations are being done as of 2017, not as of 2023. In particular, according to Thomson Reuters Municipal Market Data, BAA municipal yields (at a 12-year duration) in 2017 were 0.55% lower than in 2023.⁵⁵ Thus, we decrease the interest rate from 6.00% to 5.45%.

⁴⁹ Levy deposition, 155–169.

⁵⁰ PREPA Pension Inputs Discussion, January 5, 2023, page 3 - 4.

⁵¹ Levy deposition, 158-160.

⁵² Ibid, 160.

⁵³ See Report of David Plastino, dated May 5, 2023, paragraph 50.

⁵⁴ [REDACTED]

⁵⁵ The Thomson Reuters Municipal Market Data (MMD) for BAA rated bonds at a 12-year duration showed a yield of 3.72% in March 1, 2023, and 3.17% on July 1, 2017, for a decrease of 0.55%. I determined the duration of the Pension Claim to be approximately 12 years.

F. \$299 million of the overstatement is attributable to use of an overly conservative discount rate assumption for pension funding.

An actuarial present value is akin to a “hypothetical pot of money.”

102. Financial analysts regularly deploy present value concepts in their work. Actuaries take these present value concepts one step further and determine an “actuarial present value.”

103. To the layperson, however, an actuarial present value is nothing more than the “hypothetical pot of money” needed at a point in time to fund the expected payouts associated with, say, a pension obligation. In other words, it addresses how much money would be needed to be contributed today to fund all the benefits needed in the future.

The Pension Claim can be thought of as the “hypothetical pot of money” expected to be needed at the claim valuation date to fund the vested pensions earned as of that date.

104. The Pension Claim is based on the vested benefits earned as of the claim valuation date. Because pension benefits are paid over retirees’ lifespans, assumptions have to be made in order to ascertain an expected value of those vested pensions. The resulting calculation of actuarial present value results in the amount needed in the “pot” in order to fund those future vested pension payments.

105. Because of uncertainty about the future, valuing the “hypothetical pot of money” requires making certain assumptions, most importantly about how much money the pot can be expected to earn over the future years of expected payouts.

The reputable and widely used Horizon study indicates an expected rate of return assumption of 6.30% for the PREPA ERS as of June 30, 2017.

106. The first step in determining a reasonable rate of return requires the consideration of a fund’s asset valuation. In this case, [REDACTED]

[REDACTED] From that distribution, the next step is to determine what rate of return that distribution generates on average.

107. The best available source for these assumptions is the Survey of Capital Market Assumption, 2017.⁵⁶ Horizon Actuarial Services, LLC, annually surveys and aggregates the capital market assumption models from dozens of reputable investment advisors⁵⁷ in order to create an industry-wide perspective into the capital market expectations of the major investment firms in the United States. This survey is the most widely used survey by pension plan sponsors

⁵⁶ <https://www.horizonactuarial.com/blog/2017-survey-of-capital-market-assumptions>

⁵⁷ 35 investment advisors participated in the 2017 survey.

and actuaries across the U.S. In fact, PREPA ERS itself, relies on the Horizon survey for research into expected returns.⁵⁸

108. Applying the Horizon Survey methodology to the PREPA ERS asset target allocation in 2017 yielded a geometric (annually compound) expected portfolio return of 6.30%. While the actual future returns on a pot of money invested as of June 30, 2017 would no doubt be different from the 6.30% due to the inevitable volatility of investment results, the 6.30% is an unbiased return expectation set in accordance with ASOP No. 27, Selection of Economic Assumptions for Measuring Pension Obligations.⁵⁹ See Appendix E for more detail on the development of this expected return assumption.

6.30% is a reasonable discount rate assumption for determining and discounting future PREPA ERS ADCs as of June 30, 2017, and in my opinion is more reasonable than using either 3.58% or 5.75% as an expectation of earnings for a “pot of money” that is representative of the Pension Claim.

109. In my opinion, 6.30% is a reasonable discount assumption both for determining ADC's as well as for discounting those ADCs back to the claim valuation date, June 30, 2017. Applying the hypothetical pot of money logic, the most commonly used logic for setting discount rates that reflect the time value of money, the long term expected investment return of 6.30% produces a reasonable, unbiased, Pension Claim measure.

110. The Oversight Board offers no rationale for either of the two alternative rates underlying the Disclosure Statement measure of the Pension Claim (neither 3.58% nor 5.75%), and there is a strong rationale for using 6.30%. The overstatement of the Disclosure Statement's Pension Claim caused the inappropriate use of overly conservative discount rates is \$299 million. Details are provided in Appendix D.

G. Summary tabulation of the reasonable and appropriate Pension Claim of \$2.616 billion after correcting for the \$1.339 billion of overstatements.

111. The table below tabulates the impact of the key corrections to the Disclosure Statement's estimate of the Pension Claim. In my opinion, a reasonable, unbiased estimate of the Pension Claim is \$2.616 billion. The detail of all these adjustments to the Pension Claim are shown in Appendix D.

⁵⁸ For example, see the June 30, 2019 Audited Financial Statements, Page 73.

⁵⁹ Actuarial Standard of Practice No. 27 Revised Edition Selection of Economic Assumptions for Measuring Pension Obligations, Doc. No. 172.

The Pension Claim is \$2.616 billion after making five key corrections to the estimate in the Disclosure Statement (\$ billions).

	Impact of Correction		Value of Pension Claim as of June 30, 2017
	Incremental	Cumulative	
Disclosure Statement	--	--	\$3.955
Value vested benefits only; measure value using unit credit method	(\$0.407)	(\$0.407)	\$3.548
Correct for inadvertent over-funding	(\$0.087)	(\$0.494)	\$3.461
Correct for reasonable cost of borrowing	(\$0.546)	(\$1.040)	\$2.915
Correct to reflect reasonable expected rate of return	(\$0.299)	(\$1.339)	\$2.616

VI. THE PLAN PROVIDES A RECOVERY OF BETWEEN 89% AND 95% OF THE CLAIM AMOUNT

A. The Pension Recovery Percentage in the Disclosure Statement is understated.

112. In my opinion, the Disclosure Statement's Pension Recovery Percentage of 86% is significantly understated. My calculation of the Recovery Percentage is between 89% and 95%.

113. The understatement is attributable to these factors:

- The *Pension Claim* differs from the overstated Pension Claim reported in the Disclosure Statement, as I described in the preceding section of this report.
- The correctly computed *value of the Pension Recovery* differs from the overstated value reported in the Disclosure Statement, as I describe below in this section of my report.
- I further describe and quantify the overstatement of the Pension Recovery in the following section. In addition, I consider the discounting of the year-by-year Pension Recovery at two different discount rates.

B. The various Recovery Ratios calculated by the Oversight Board and shown in the Disclosure Statement contain flaws and inconsistencies.

114. The 86% "approximate recovery" percentage⁶⁰ shown in the Disclosure Statement is based on a flawed calculation, as I will explain below.

115. The Pension Recovery Percentage is the ratio of the amount of the Pension Recovery to the Pension Claim – in other words, the portion of the Pension Claim that is to be recovered. Pension benefits are typically both funded by contributions over a period of years and paid out to participants over a period of years. Thus, both Pension Claim and the Recovery amounts are each a single actuarially calculated present value, as of a specific point of time, covering the pension benefits to be funded and paid over a number of years.

116. The actuarially calculated present value (both for the Pension Claim and for the Pension Recovery) is essentially, in layman's terms, simply the benefits to be funded and paid over a period of years "collapsed" into a single value.

117. It stands to reason that when comparing the amount to be recovered within the amount of the Pension Claim, the two periods of years over which the pensions are funded (i.e., the Pension Claim) and paid out (i.e., the Pension Recovery) should be the same. However, in the case of the 86% shown in the Disclosure Statement, the period of years used in the recovery amount is not the same as the period of years used in the claim amount.

⁶⁰ Ibid, page 29.

118. The Pension Recovery Percentage of 86% in the Disclosure Statement appears to be calculated based on the Pension Claim in the Disclosure Statement of \$3.955 billion⁶¹ and the adjusted Recovery of \$3.412 billion shown later in the Disclosure Statement.⁶²

119. [REDACTED]
[REDACTED]
[REDACTED]
This results in shortchanging the dollar amount of the Oversight Board's Recovery by \$348.6m – [REDACTED].

120. I also note that this 86% Recovery Ratio was not a figure that Ms. Levy had been aware of, as evidenced by this exchange in her deposition.⁶⁵

Question: Let's go back to page 28 for a moment. Are you aware of any document that reflects how the 86 percent recovery was calculated?

Answer: No.

The Oversight Board has stated at least one other Recovery Percentage that conflicts with and is not consistent with the 86% shown in the Disclosure Statement and which thereby creates confusion.

121. The Oversight Board's PREPA Pension Claim and Recovery document dated January 27, 2023 details the calculation of a Pension Recovery Percentage that differs from the Recovery Percentage in the Disclosure Statement. The Recovery Percentage in that document is [REDACTED].

122. Ms. Levy, testified in her deposition that the January 27 document containing the [REDACTED] Recovery percentage [REDACTED] million Claim was created in whole by her and her team.⁶⁶ Levy further confirmed that she calculated the \$3.955 billion Pension Claim.^{67,68}

123. Levy stated that the most recent Recovery amount she had calculated was not the \$3,412 million shown in the Disclosure Statement, but rather [REDACTED]. Using this recovery amount results in a Recovery Ratio of [REDACTED].

Question: So this [REDACTED], is that correct?

⁶¹ Ibid.

⁶² Ibid, page 81.

⁶³ PREPA Pension POA Savings Estimates February 8, 2023 with exhibit 6 appended April 26, 2023

⁶⁴ [REDACTED]

⁶⁵ Levy deposition, 43:12-17

⁶⁶ Ibid, 46:8-17

⁶⁷ Ibid, 40:25-41:6.

⁶⁸ I note that Levy's Claim of [REDACTED] which is slightly different than the Claim shown in the Disclosure Statement, but for purposes of my report I am assuming that these are the same figures based on Levy's deposition.

Answer: That is the most recent amount that I estimated based on the most recent instructions given to me related to the recovery.

Question: And you see there, it says "recovery percentage, [REDACTED]?"

Answer: Yes.

124. Ms. Levy's Recovery Percentage is the ratio of the Recovery payments (from fiscal years 2018 – 2059) to the Claim payments (from the same fiscal years, 2018 – 2059).

The Implied 94% Recovery percentage

125. The combination of Pension Claim and Pension Recovery percentage in the most recent Disclosure Statement can also be used to create a 94% Pension Recovery percentage. This is computed by using the \$3.412 billion Pension Recovery (as described above) and yet a different Pension Claim amount of \$3.622 billion.⁶⁹

126. The Pension Claim of \$3.622 billion is obtained by removing contributions from 2018 to 2023, as described in footnote 41 of the most recent Disclosure Statement. In this calculation both the Claim and the Recovery percentage are [REDACTED]
[REDACTED]⁷⁰ This removed the flaw of using different years for Pension Claim and Pension Recovery. The result is that the Pension Recovery Percentage increases from 86% to 94%.

C. The Pension Recovery amount reported in the Disclosure Statement is overstated.⁷¹

The Pension Recovery amount reported in the Disclosure Statement inappropriately includes benefits that were not vested as of the claim valuation date.

127. Because the proper determination of the Pension Claim should include only benefits that are vested as of the claim valuation date, the same should be true of the Pension Recovery amount.

128. The Pension Recovery amount reported in the Disclosure Statement also includes both benefits that were earned by employees after June 30, 2017 as well as employees that were hired after June 30, 2017. Thus, to be consistent and to assure an "apples-to-apples" comparison, I have removed from my calculation of the Pension Recovery amount any benefits derived from the continued accrual of pension benefits after June 30, 2017 or from employees hired after June 30, 2017.

⁶⁹ Disclosure Statement for Modified Second Amended Title III Plan of Adjustment, page 29, footnote 41.

⁷⁰ PREPA Pension POA Savings Estimates February 8, 2023 with exhibit 6 appended April 26, 2023, page 2.

⁷¹ In fact, the March 1, 2023 Disclosure Statement provides no detail on the precise amount of the Pension Recovery. However, the preliminary Disclosure Statement dated January 27, 2023 does include such detail. It is this January 27, 2023 detail on which I rely for purposes of my analysis. My year-by-year recalculation of the Pension Recovery amount reflecting the two identified corrections is shown in Appendix F.

The Pension Claim recovery amount reported in the Disclosure Statement inappropriately includes an unreasonable allowance for expenses.

129. Just as I corrected for the unreasonably high “load” of [REDACTED] applied to the benefits and liabilities for purposes of calculating a reasonable value for the Pension Claim, the same correction should be made with respect to the Pension Claim recovery amount. Thus, to be consistent and to assure an “apples-to-apples” comparison, I have removed from my calculation of the Pension Claim recovery amount the effect of this unreasonable [REDACTED] expense “load” and replaced it with a reasonable “load” of 0.2% to recognize the additional costs of running the new PayGo+ trust. This still allows for *some* of the increase predicted by Ms. Levy, but not the [REDACTED] increase recommended by the Board.

The Pension Claim recovery amount shown in the Disclosure Statement fails to account for the investment return on the participant loans.

130. Under PREPA ERS individuals could take out loans with their pensions as collateral. These loans would then be paid back to PREPA ERS with interest. A significant amount of these loans are still outstanding, and will be paid back.

131. The pension plan has outstanding loans to participants in the amount of [REDACTED]
[REDACTED]⁷² The annual repayments of these loans impact the recovery.

132. Specifically, the Recovery anticipates that the [REDACTED]
[REDACTED]⁷³ The repayment of the loans are assumed to flow into the PREPA ERS trust and reduce the amounts needed in the PayGo+ trust to fund the current year’s benefit payments.⁷⁴

133. However, the participant loans in the amount of [REDACTED] are not assumed to earn any interest.⁷⁵ The lack of an interest return assumption on the repayment of participant loans overstates the amounts needed to fund the PayGo+ trust.

134. In my analysis, I calculated adjusted cash flows into the PREPA ERS trust appropriately reflecting interest on the loan repayment amounts. For my calculations I assumed a rate of interest based on documentation of the reported returns for these funds.

⁷² PREPA Pension POA Savings Estimates February 8, 2023 with exhibit 6 appended April 26, 2023, Appendix B.

⁷³ Ibid.

⁷⁴ Levy deposition, 187:7-15.

⁷⁵ Ibid, 196:2-9

135. The illiquid balance is known as the [REDACTED]

136. Given this data, in my recovery calculations I assume a return of 6.24% for the illiquid balance of \$156 million as of June 30, 2023. I increase the maturation assumption⁷⁹ from 5% to 10.58%⁸⁰ to account for the annual growth in the accounts. Under this new loan maturation assumption, the outstanding principle remains constant at the end of each year.⁸¹ See Appendix G for more detail.

137. As a result of factoring in investment return on the loan repayments, the amounts available in the PREPA ERS are increased each year, this reducing the amounts needed for the PayGo+ trust. As an example, in fiscal year 2024 this increases the amounts available to PREPA ERS by \$9.7 million, and this \$9.7 million in turn reduces the amounts needed to fund the associated PayGo+ trust by \$9.7 million.

138. Recognizing the investment return on participant loan repayments, I estimate that this decreases the amount PREPA needs to fund PayGo+. This has a value of \$85 million when such investment return is discounted using the Oversight Board's prescribed rate of 3.58%. See Appendix G of this report for more detail.

D. Despite Ms. Levy stating her most recent Recovery Percentage was [REDACTED] and evidence of a 94% Recovery Percentage, the Disclosure Statement still shows an 86% Recovery Percentage. The proper Recovery Percentage is either 89% or 95%, depending on which interest rate assumption is used for discounting.

139. The Disclosure Statement anticipates a 3.58% interest rate for discounting the year-by-year recovery cash flows and so for comparison purposes, I have discounted the corrected recovery cash flows using that same 3.58% rate. I am using this rate for comparability to the Oversight Board's calculations only.

⁷⁶ 2022 Certified Fiscal Plan for the Puerto Rico Electric Power Authority As certified by the Financial Oversight and Management Board for Puerto Rico on June 28, 2022, page 175.

⁷⁷ Asset Consulting Group Employees' Retirement System of Puerto Rico Electric Power Authority For the Periods Ending June 30, 2017

⁷⁸ Asset Consulting Group Employees' Retirement System of Puerto Rico Electric Power Authority For the Periods E [REDACTED]

⁸⁰ This assumption was chosen such that the principle remaining at each future fiscal year remains the same, so the only difference accounting for interest. [REDACTED]

⁸¹ For example, if [REDACTED] in loans mature under the Oversight Board's assumption then the balance after [REDACTED]

140. As shown in the prior section, I have calculated a Pension Claim that makes corrections to the Oversight Board's calculations while using a 5.75% discount rate but a 5.45% to discount the ADCs. I have shown the Pension Recovery Percentage on this basis in the table below.

141. As shown in the preceding section of this report, I have recalculated the value of the corrected Pension Claim using a 6.30% discount rate. So, for the purposes of an additional "apples-to-apples" comparison I have also discounted the recovery cash flows using this rate.

142. The table below summarizes my recalculation the present value of the corrected year-by-year Pension Recovery amounts at 3.58%, 5.45% and 6.30%, and then compares those values to the corresponding Pension Claim values in order to calculate a range of reasonable and appropriate measures of the Pension Recovery Percentages: 89% to 95%

Reasonable and appropriate measure of the Recovery Percentage (\$ billions)

	Disclosure Statement ⁸²	Reflecting Pension Claim Recovery Corrections		
		Discounting at 3.58% ⁸³	Discounting at 5.45%	Discounting at 6.30%
Pension Claim	\$3.955	\$3.461	\$2.915	\$2.616
PV of Recovery	\$3.412	\$3.281	\$2.582	\$2.334
Recovery percentage	86%	95%	89%	89%

143. The table below summarizes applies the various recovery percentages (shown in the Disclosure Statement⁸⁴) to the correctly calculated Pension Claim of \$2.616 billion.

Claimant	Disclosure Statement: Approx. Recovery (%)	Application of Approx Recovery to the Pension Claim of \$2.616b
Non-Settling Bondholder and Non-Settling Monoline Claims	46.49% ⁸⁵	\$1.216 billion
Pension Claim	86%	\$2.250 billion
Fuel Line Loan Claims	84%	\$2.198 billion
National Insured Bond Claims	71.65%	\$1.875 billion

⁸² Disclosure Statement for Modified Second Amended Title III Plan of Adjustment page 29. PV of recovery of \$3.412 billion is inferred as 86% of \$3.955 billion.

⁸³ Based on the discount rate selected by the Oversight Board, PREPA Pension POA Savings Estimates February 8, 2023 with exhibit 6 appended April 26, 2023, Appendix E.

⁸⁴ Disclosure Statement for Modified Second Amended Title III Plan of Adjustment, page 29.

⁸⁵ Approx. Recovery (%) under scenario "Oversight Board wins lien counts but loses recourse counts." I understand from counsel that these numbers may not reflect the full recoveries available to these claimants under the Plan of Adjustment.

VII. RESPONSE TO THE EXPERT REPORT OF JOSE FERNANDEZ

144. Jose Fernandez is the President and Consulting Actuary of Fase2 C&W, LLC (Fase2), a consulting group that provides actuarial services for “public pension systems.” His opening report was submitted by PREPA ERS to this Court on April 28, 2023.

A. Fernandez failed to take into account \$595 million in assets when setting his claim. This and other mistakes cause his claim to be overstated by \$936 million

145. Fernandez asserts that the ERS Retirement System’s claim is \$4,459.5 million based on the June 30, 2021 actuarial valuation report using a 5.75% discount rate⁸⁶. This is a flawed claim number in numerous ways.

146. The bankruptcy petition date is July 2, 2017. The closest pension measurement date is June 30, 2017 and not June 30, 2021. The date of June 30, 2021 is irrelevant to this process. However, for purposes of this analysis, I show the flaw in his claim methodology using his measurement date of June 30, 2021.

147. Fernandez’s claim is based on an actuarial liability known as the “Present Value of Future Benefits”, which exceeds the Entry Age Normal actuarial accrued liability by \$229.7 million due to valuing all future pay and future service for active employees. Reducing his claim of \$4,459.5 million⁸⁷ by the amount of liability on account of future pay and service reduces the claim to \$4,229.8 million, which is the Entry Age Normal actuarial liability⁸⁸.

148. However, as discussed earlier in this report, the Entry Age Normal Actuarial liability itself overstates the value of the benefits that had been earned as of the measurement date. The reduced claim of \$4,229.8 million itself by \$111.5 million⁸⁹ to \$4,118.2 million. This \$4,118.2 million is the approximate unit credit liability at Fernandez’s measurement date of June 30, 2021.

149. Finally, the Pension Claim should be reduced by the assets currently available to pay pension benefits. As of June 30, 2021, the 2021 actuarial report showed a market value of asset of [REDACTED]

150. The amount of assets available to pay pension benefits as of June 30, 2023, should be reduced by contribution receivables because contribution receivables are the amount owed by PREPA to the Retirement System and had not been contributed to the pension plan. Therefore, the amount of assets available to pay pension benefits is \$594.9 million [REDACTED].

⁸⁶ In Mr. Jose Fernandez’s expert declaration, page 8, he states that “The total actuarial liabilities of \$4,459.5 million is the estimated claim by the Retirement System to maintain the promised benefits under the current System without any changes or reform.”

⁸⁷ Employees’ Retirement System of Puerto Rico Electric Power Authority Report on the Seventy-Sixth Actuarial Valuation As of June 30, 2021, page 7.

⁸⁸ Ibid, page 1.

⁸⁹ This calculation is estimated based on my June 30, 2017 results.

151. After reducing the claim by the amount of assets available to pay benefits, Fernandez's claim after correcting for his flawed methodologies would have been \$3,523.3 million measured at a 5.75% discount rate as of June 30, 2021, a reduction of \$936 million from his original Claim of \$4,459.5 million

B. Correcting for Fernandez's flaw claim amount, the Recovery Percentage would have been 95%.

152. Fernandez calculates a Recovery of \$3,344.8 million as of June 30, 2023⁹⁰. This Recovery amount is calculated as the present value of benefits reflecting the Oversight Board's pension reforms using a 5.75% discount rate. To obtain the Recovery Percentage, Fernandez divides the Recovery amount \$3,344.8 million by his Claim amount. He calculates 75% as the Recovery Percentage.

153. His Recovery Percentage calculation suffers from the problem of mismatched dates because the recovery amount of \$3,344.8 million is as of June 30, 2023, while his claim is calculated as of June 30, 2021. The mismatch of the "as of" dates causes different years to be used for Claim versus Recovery. This mismatch of dates would produce unreliable Recovery Percentage.

154. Putting aside the mismatch of dates, if I take his recovery amount of \$3,344.8 million and divide it by the corrected claim amount of \$3,523.3 million, the Recovery Percentage would have been 95%, significantly higher than his 75% Recovery Percentage.

155. In Fernandez's report, he also calculates a recovery of \$3,746.0 million if the Retirement System were to receive 84% of the Pension Claim, the same Recovery Percentage as the Fuel Line lenders (FLL). However, the \$3,746.0m figure is based on his flawed Pension Claim of \$4,459.5m. If the corrected Pension Claim of \$3,523.3m is used, the 84% Recovery Percentage would produce a much lower Recovery amount of \$2,959.6m.

C. Mr. Fernandez's analysis of the Retirement System's reform proposal is flawed and results in an inexplicable conclusion.

156. In his report, Mr. Fernandez also summarizes the Retirement System's reform proposal, which proposes to eliminate future pension increases for current inactive members (i.e., current retirees, beneficiaries, and terminated vested members entitled to deferred benefits), while maintaining all active employees' current benefits in a new defined benefit trust. This proposal provides for more generous pension benefits than the Oversight Board's proposed pension reform for active members.

157. Mr. Fernandez's analysis of the actuarial viability of the Retirement System's proposal depends crucially on the initial funding of the new plan for active members. As he stated,

⁹⁰ Mr. Jose Fernandez's expert declaration, page 9.

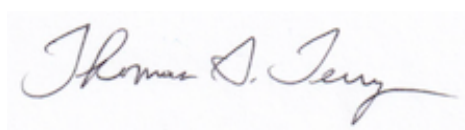
The employer contributions will vary depending on the funds the new plan will receive to fund the actuarial accrued liabilities transferred from the current System....The greater the initial assets of the new plan, the lower the ongoing employer contributions.⁹¹

158. In his analysis of the actuarial viability of the Retirement System's proposal under the assumption that the Retirement System receives the same treatment as the Fuel Line Lenders (FLL), Mr. Fernandez assumes that \$731.6⁹² million would be available as the initial assets for the new active employees' plan. With this initial funding, he shows a total savings of \$656.1 million for the Retirement System's proposal compared to the Oversight Board's proposal.⁹³

159. This analysis is flawed because the purported "savings" is obtained by not counting the initial asset of \$731.6 million as a cost to the employer. If the initial asset of \$731.6 million are added in as an employer cost under the Retirement System's proposal, then the "savings" would disappear. Further, his total savings is the nominal sum of the differences in annual employer contributions on or after fiscal year 2024. This has the effect of counting the investment earnings on the initial assets as future savings. Thus, by not counting the initial \$731.6 million as a cost but including the future investment returns on \$731.6 million as savings, Mr. Fernandez's methodology produced an inexplicable result, namely, that a more generous pension benefit proposal under the Retirement System ended up saving money for the employer.

160. I declare under penalty of perjury that the foregoing is true to the best of my knowledge, information and belief.

May 15, 2023



Thomas S. Terry

⁹¹ Fernandez report, page 13.

⁹² The 731.6 million is calculated as $84\% * \$4,459.5 - \$3,014.4$, where 84% is the recovery percentage for the fuel line lenders, \$4,459.5 is the "all-in" present value of future benefits, and \$3,014.4 is the current retirees' benefit obligation after the elimination of COLA

⁹³ Fernandez report, page 14.

APPENDICES

- Appendix A. Thomas S. Terry CV
- Appendix B. Materials Considered in the Preparation of this Report
- Appendix C. Data, Assumptions and Methods, and Plan Provisions
- Appendix D. Development of Reasonable and Appropriate Pension Claim Cash Flows
- Appendix E. Development of a Reasonable and Appropriate Interest Rate Assumption
- Appendix F. Development of Reasonable and Appropriate Recovery Cash Flows
- Appendix G. Participant Loan Repayment Schedule
- Appendix H. Reliance on Models

Appendix A: Thomas S. Terry CV

Thomas S. Terry, MAAA, FSA, FCA, EA
CEO
The Terry Group
130 E. Randolph Street, Suite 2810
Chicago, IL 60601

Education

Masters of Actuarial Science, Graduate School of Business Administration, University of Michigan, 1975

Bachelor of Science, Tufts University, 1973

- Summa Cum Laude
- Double major in math and physics
- Phi Beta Kappa
- Winner, N. Hobbs Knight Prize Scholarship for excellence in theoretical and practical physics

Professional Experience

The Terry Group, 2010 to present

- Founder and CEO

J.P. Morgan Compensation and Benefit Strategies, 2006 to 2010

- CEO of J.P. Morgan Compensation and Benefit Strategies
- J.P. Morgan acquired CCA Strategies in October 2006

CCA Strategies LLC, 1991 to 2006

- Co-founder and President
- Firm of approximately 200 professionals in ten offices across the U.S.

Towers Perrin, 1975 to 1991

- Principal and Vice President
- More than two thousand actuaries and employee benefits professionals world-wide
- Retirement Plan Practice Leader in Chicago office

Professional Associations and Research Organizations: Roles and Memberships

International Actuarial Association (association of world-wide actuarial associations):

- President, 2017
- Chair, Pensions and Employee Benefits Committee, 2015

Global Aging Institute (Washington DC based research organization):

- Board Chair, 2014 to present

American Academy of Actuaries (national professional association for US practicing actuaries):

- President, 2014
- Board of Directors, 2005 to 2009, 2013 to 2015
- Chair of Public Interest Committee, 2009 to 2012
- Member, Strategic Planning Committee, 2010
- Vice President for Pensions, 2007 to 2009
- Chair of Stock Options Task Force, 2004 to 2008
- Chair of Defined Benefit Revitalization Task Force, 2002 to 2004
- MAAA, since 1981

Board of Actuaries (oversight responsibility for the U.S. government's Civil Service Retirement System and the Federal Employees Retirement System):

- Board chair, since 2013
- Board member, since 2010

Social Security Advisory Board Technical Panel:

- Member, 2018-2019

Society of Actuaries (education and research):

- Vice President and board member, 2010 to 2012
- Board member, 2007 to 2010
- FSA, since 1976

Conference of Consulting Actuaries (continuing education):

- President-elect, President, 2006 to 2007
- Treasurer, 2003 to 2005
- Vice President, Pensions, 2001 to 2003
- Board member, 2001 to 2009
- Member, since 1982, FCA, since 2001

Publications

Communicating Longevity Risk – More Things to Think About

Co-authored with Liaw Huang; Contingencies Magazine, November-December 2015

Communicating Longevity Risk – Beyond the Definitions

Co-authored with Liaw Huang; Contingencies Magazine, September-October 2015

Uncertain Times, Plural Rationalities and the Pension Fiduciary in *Handbook of Institutional Investment and Fiduciary Duty* (edited by James P. Hawley, et al, 239-253) Liaw Huang, David Ingram, Thomas Terry, and Michael Thompson – Cambridge University Press, 2014

Public Interest – Preserving the Trust

President's Message, Contingencies Magazine, November-December 2014

The Aging of America

President's Message, Contingencies Magazine, September-October 2014

A New Retirement Paradigm

President's Message, Contingencies Magazine, July-August 2014

Public Confidence – What Does It Take?

President's Message, Contingencies Magazine, May-June 2014

Promoting Objective Public Policy in a Partisan World

President's Message, Contingencies Magazine, March-April 2014

Keeping Up with the Brits

President's Message, Contingencies Magazine, January-February 2014

A Year Well Spent

President's Message, Contingencies Magazine, November-December 2013

Communicating Longevity Risk – Beyond the Definitions

Co-authored with Liaw Huang; presented in Beijing at Longevity 9 Conference, 2013

Congressional Testimony

Testimony on Social Security's Current Benefit Expenditures, Proposed Changes to Future Benefits and the Impact Those Change Would Have on the Program, Future Beneficiaries, Workers, and the Economy. U.S. House of Representatives Ways and Means Committee Subcommittee on Social Security, July 2011

Expert Trial or Deposition Testimony within Previous Ten Years

Berube v. Rockwell Automation Inc., et. al., Case No. 2:20-cv-01783 (United States District Court Eastern District of Wisconsin)

Williams v. Retirement Plan for Chicago Transit Authority Employees, et al., Case No. 11-CH-15446 (Circuit Court of Cook Co., IL)

Guenther v. BP Retirement Accumulation Plan, Case No. 4:16-CV-995 (S.D. Tex.)

Smith (Thorne) v. U.S. Bank, Case No. 18-cv-03405-PAM-KMM (D. Minn.)

Cruz v. Raytheon Co., Case No. 1:19-cv-11425-PBS (D. Mass.)

Herndon v. Huntington Ingalls Industries, Case No. 4:19-cv-00052-RCY-LRL (E.D. Va.)

Dallas Police & Fire Pension System v. Buck Global LLC, et al. Case no. DC-18-16385 (The District Court of Dallas County, Texas, 298th Judicial District.)

City of Houston v. Towers Watson & Co., Case No. 4:14-cv-02213 (Southern District of Texas Houston Division of the Federal District Court.) (2017)

Johnston v. Dow Employees' Pension Plan, Case No. 1:14-cv-10427-TLL-CEB (Eastern District of Michigan Federal District Court) (2015)

City of Detroit Bankruptcy Proceedings, Case No. 13-53846 (United States Bankruptcy Court, Eastern District of Michigan Southern Division) (2014)

In Re: Patriot Coal Corporation, et. al., Case No. 12-51502-659 Chapter 11 (United States Bankruptcy Court, Eastern Division of Missouri) (2013)

Appendix B: Materials Considered in the Preparation of this Report

Disclosure Statement for Modified Second Amended Title III Plan of Adjustment of the Puerto Rico Electric Power Authority (without exhibits), March 1, 2023 (Document # 3297)

Exhibit G - Summary of Pension Reform (Document # 3279-7)

Exhibit Q - Analysis of Savings of CBA Modifications (Document # 3279-17)

2022 Certified Fiscal Plan for the Puerto Rico Electric Power Authority, as certified by the Financial Oversight and Management Board for Puerto Rico on June 28, 2022

Cavanaugh MacDonald 2021 LUMA Study, March 8, 2021 (235915 - Cavanaugh MacDonald 2021 LUMA Study.pdf.pdf)

Employees' Retirement System of Puerto Rico Electric Power Authority Report on the Seventy-Second Actuarial Valuation as of June 30, 2017, July 8, 2019

Employees' Retirement System of Puerto Rico Electric Power Authority Report on the Seventy-Second Actuarial Valuation as of June 30, 2019, August 6, 2020

Employees' Retirement System of Puerto Rico Electric Power Authority Report on the Seventy-Second Actuarial Valuation as of June 30, 2021, February 21, 2023

PREPA Financial Statements, Required Supplementary Information and Supplemental Schedules, Years Ended June 30, 2013 and 2012 With Report of Independent Auditors (PREPA - Audited Financial Statement FY '12 and FY '13.pdf)

PREPA Financial Statements, Required Supplementary Information and Supplemental Schedules, Years Ended June 30, 2014 and 2013 With Report of Independent Auditors (PREPA 2013 and 2014 Financial Statements.pdf)

PREPA Financial Statements, Required Supplementary Information and Supplemental Schedules, Year Ended June 30, 2015 With Report of Independent Auditors (corrected) (PREPA - Audited Financial Statement FY '14 and FY '15 (corrected).pdf)

PREPA Independent Auditors' Report, Audited Financial Statements, Required Supplementary Information and Supplemental Schedules, for the year ended June 30, 2016 (PREPA - Audited Financial Statement FY '15 and FY '16.pdf)

PREPA Independent Auditors' Report, Audited Financial Statements, Required Supplementary Information and Supplemental Schedules, for the year ended June 30, 2017 (PREPA - Audited Financial Statement FY '16 and FY '17.pdf)

PREPA Audited Financial Statements, Required Supplementary Information and Supplemental Schedules, For the fiscal year ended June 30, 2019 (with Independent Auditors' Report Thereon) (PREPA - Audited Financial Statement FY Ended 6-30-2019.pdf)

PREPA Audited Financial Statements and Required Supplementary Information, For the fiscal year ended June 30, 2020 (with Independent Auditors' Report Thereon) (PREPA - Audited Financial Statement FY Ended 6-30-2020.pdf)

PREPA Audited Basic Financial Statements and Required Supplementary Information, For the fiscal year ended June 30, 2021 (with Independent Auditors' Report Thereon) (PREPA - Audited Financial Statement FY Ended 6-30-2021.pdf)

PREPA Pension Claim and Recovery, January 27, 2023 (Prepa Claim and recovery exhibit 1.27.23.pdf)

PREPA_3.1 Update v2.pdf.pdf

PREPA Employee Retirement System Regulations, Amended April 26, 2018 (retirement_system_regulations.pdf.pdf)

Horizon Survey of Capital Market Assumptions, 2017 Edition (available at https://www.horizonactuarial.com/uploads/3/0/4/9/30499196/horizon_cma_survey_2017_v0822.pdf)

Asset Consulting Group Employees' Retirement System of Puerto Rico Electric Power Authority For the Periods Ending June 30, 2017

Asset Consulting Group Employees' Retirement System of Puerto Rico Electric Power Authority For the Periods Ending June 30, 2022

PREPA Pension Claim and Recovery Discussion January 27, 2023 (PREPA Claim and Recovery Discussion 1-27-23.pdf)

PREPA Pension POA Savings Estimates February 8, 2023 with exhibit 6 appended April 26, 2023 (Prepa exhibits 4.26.23.pdf)

PREPA Pension Inputs Discussion January 5, 2023 (PREPA Pension Inputs Discussion 1-5-23.pdf)

Report of the Blue Ribbon Panel on Public Pension Plan Funding, February 2014

Expert Declaration of Mr. José Fernandez, dated April 28, 2023

Deposition of Sheva Levy, dated May 10, 2023

Report of David Plastino, dated May 5, 2023

Debtor's Opening Expert Report and Disclosures (ECF No. 3418), dated April 28, 2023

US Code Title 11

Code of Professional Conduct

Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States, Effective January 1, 2022.

Actuarial Standard of Practice No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions

Actuarial Standard of Practice No. 17, Expert Testimony by Actuaries

Actuarial Standard of Practice No. 23, Data Quality

Actuarial Standard of Practice No. 27, Selection of Economic Assumptions for Measuring Pension Obligations

Actuarial Standard of Practice No. 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations

Actuarial Standard of Practice No. 41, Actuarial Communications

Actuarial Standard of Practice No. 56, Modeling

Appendix C: Data, Assumptions and Methods, and Plan Provisions

The following outlines the assumptions, methods, data and plan provisions I used to replicate results presented in the “Employees’ Retirement System of Puerto Rico Electric Power Authority report on the Seventy-Second Actuarial Valuation as of June 30, 2017” prepared by Cavanaugh Macdonald, the retirement system’s actuary, and issued on July 8, 2019 (“2017 Actuarial Valuation”). In my replication I used actuarial assumptions and methods described in and thus consistent with the 2017 Actuarial Valuation—the retirement system’s own assumptions and methods—and is the basis upon which I perform my projections.

As seen below, I was able to replicate both the key characteristics of the member data and the associated active, inactive and total actuarial accrued liabilities.

Replication Results

The following chart compares key results as of June 30, 2017 published in the 2017 Actuarial Valuation with the results of the replication process (“Replication Results”) (dollars in millions).

Item	2017 Actuarial Valuation	2017 Replication Results
Active headcount	6,196	6,196
Inactive headcount	12,435	12,435
Active pensionable compensation	\$253.6	\$253.6
Active actuarial accrued liability	\$1,054.1	\$1,118.2
Inactive actuarial accrued liability	\$3,123.8	\$3,067.1
Total actuarial accrued liability	\$4,177.9	\$4,185.3

Actuarial Assumptions

All actuarial assumptions used for the 2017 Replication Results are consistent with Section D of the 2017 Actuarial Valuation.

Actuarial Cost Method

The actuarial cost method used for the 2017 Replication Results is the Individual Entry Age Normal actuarial cost method, consistent with the 2017 Actuarial Valuation (see pages 19 and 23).

Active Demographic Data

Individual active participant records as used in the 2017 Actuarial Valuation were not available. The 2017 active census data was estimated based on the Schedule of Active Member Data presented in Schedule G of the 2017 Actuarial Valuation which a) provides the number of active participants by age and service bands, b) provides the total payroll for each age band, and c) provides average age and average service.

The Schedule of Active Member Data is shown below:

Age	Completed Years of Service								Payroll \$(000)
	x < 5	5 <= x < 10	10 <= x < 15	15 <= x < 20	20 <= x < 25	25 <= x < 30	30 <= x	Total	
x < 20	1	0	0	0	0	0	0	1	\$36
20 <= x < 25	5	1	0	0	0	0	0	6	\$193
25 <= x < 30	41	34	1	0	0	0	0	76	\$2,545
30 <= x < 35	54	157	64	0	0	0	0	275	\$9,936
35 <= x < 40	59	172	475	79	0	0	0	785	\$30,004
40 <= x < 45	36	110	466	486	81	2	0	1181	\$46,730
45 <= x < 50	39	101	397	462	396	180	1	1576	\$64,428
50 <= x < 55	26	49	177	268	266	466	23	1275	\$56,164
55 <= x < 60	4	37	99	138	156	245	30	709	\$30,465
60 <= x < 61	0	1	10	21	15	40	3	90	\$3,690
61 <= x < 62	1	3	6	15	12	21	2	60	\$2,595
62 <= x < 63	1	0	8	12	14	24	2	61	\$2,508
63 <= x < 64	0	1	4	2	7	8	0	22	\$937
64 <= x < 65	0	1	0	3	5	7	4	20	\$894
65 <= x < 66	0	0	2	3	3	4	2	14	\$574
66 <= x < 67	0	0	0	0	0	5	0	5	\$242
67 <= x < 68	0	0	1	1	4	2	2	10	\$388
68 <= x < 69	0	0	2	3	0	3	0	8	\$375
69 <= x < 70	0	0	0	2	0	2	0	4	\$156
70 <= x	0	2	3	2	3	6	2	18	\$719
<Total>	267	669	1715	1497	962	1015	71	6196	\$253,580

I was able to replicate the table above using estimated data including matching the counts in each age and service cell and matching the payroll dollars for each age band. In addition, the following summary statistics were matched:

Item	2017 Valuation Report	2017 Replication Results
Average age	■	■
Average service	■	■

Note that within each age and service cell in the table above, individual ages, years of service and payroll were estimated.

The gender distribution was not provided; for my analysis I assumed that 75% of actives are male.

Inactive Demographic Data

Individual inactive participant records as used in the 2017 Actuarial Valuation were not available. The 2017 inactive census data was estimated based on the summary of the inactive data presented in the 2017 Actuarial Valuation (see Table 3, The Number and Annual Retirement Benefits of Retired Members and Survivors of Deceased Members as of June 30, 2017 on page 5). The following is a summary of the inactive data used:

Status	Count	Average Age	Total Annual Annuity Benefits (\$ millions)
Retiree	█	█	█
Disabled	█	█	█
Beneficiary	█	█	█
Term Vested	█	█	█

The █ Terminated Vested participants were assumed to be evenly distributed across the ages of █. Each participant was assumed to have a benefit payable at age 60 of \$9,900 per year.

The gender distribution was not provided, as such it was assumed that 75% of retirees, disabled participants and terminated vested participants were male; 25% of beneficiaries were assumed to be male.

In addition, simplifying assumptions were made with respect to the inactive participant data as follows:

- Individual ages and benefit amounts for retirees, disabled and beneficiaries were estimated such that, in total, the amounts were matched to the table above. Generally, annuity benefits were distributed such that younger annuitants were assumed to have higher annual benefits than older annuitants.
- A single life annuity form of payment was assumed to be payable for 83% of current retirees and disabled participants and 17% were assumed to have elected the 30% J&S form of payment with wives 4 years younger than their husbands. The age difference is consistent with the 2017 Actuarial Valuation.
- All retirees, disabled, beneficiaries and terminated participants with deferred vested benefits were assumed to be eligible for the Christmas and Summer bonuses.
- All retirees and disabled retirees were assumed to be eligible for the \$1,000 funeral death benefit.

Plan Provisions for the PREPA Employee Retirement System

a) Participation

All employees who were identified as participants for purposes of the actuarial valuation were assumed to be eligible to participate in the Plan.

b) Final Average Compensation

Average of the three highest annual base salaries. For new members hired on or after January 1, 1993, annual compensation is limited to \$50,000.

Note: The annual salary as reported in the actuarial valuation is assumed to already reflect the \$50,000 annual pay limit.

c) Accrued Basic Benefit

The accrued basic benefit is an annual amount equal to [REDACTED] of Final Average Compensation multiplied by service [REDACTED] of Final Average Compensation multiplied by service in excess of [REDACTED], with a total maximum amount of seventy-five percent (75%) of Final Average Compensation.

The accrued basic benefit is assumed to be supplementary to any benefits payable under the Social Security Act for all participants.

d) Retirement Benefits

Basic retirement benefit

Eligibility: Age 60 with at least 5 years of service or any age with 20 or more years of service

Amount: Accrued basic benefit payable at [REDACTED] for the life of the participant with [REDACTED] of the benefit continuing to the surviving spouse. A participant who retires with [REDACTED] of service but is under [REDACTED] may elect to commence benefits immediately at retirement and receive an actuarially reduced benefit to the benefit that would have been payable at [REDACTED].

Merit retirement benefit

Eligibility

- Hired before 1/1/1993: 30 years of service (or reduced benefits [REDACTED] of service)
- Hired on/after 1/1/1993: age 55 with 30 or more years of service (or reduced benefits after [REDACTED] with 30 or more years of service)

Amount: Annual amount equal to seventy-five percent (75%) of Final Average Compensation.

The merit benefits is assumed to be supplementary to any benefits payable under the Social Security Act for all participants.

Early merit benefits

For those hired before January 1, 1993 and who retire after 25 years of service (but before [REDACTED]), the merit benefit is equal to 2.5% of Final Average Compensation multiplied by years of service.

For those hired on or after January 1, 1993 and who retire after [REDACTED] or more years of service (but prior to [REDACTED]), a reduced merit benefit is available.

e) Separation Pension

Eligibility: less than [REDACTED] years of service

Amount: A participant who terminates prior to [REDACTED] or more years of service will receive a lump sum equal to the amount of the participant's accrued contributions through the date of termination.

Eligibility: [REDACTED] or more years of service

Amount: A participant who terminates with [REDACTED] more years of service, may choose to receive the basic accrued benefit commencing at [REDACTED] (calculated based on final average compensation and service at termination), in lieu of a refund of accrued contributions.

f) Disability Pension

Eligibility: Participants who terminate due to disability prior to reaching retirement eligibility will be eligible for disability benefits as follows:

- Hired before 1/1/1993: 5 years of service
- Hired on/after 1/1/1993: 10 years of service

Amount: [REDACTED]

Participants who are eligible for the basic retirement benefit or merit retirement benefit who terminate due to disability, will receive the retirement benefit for which they would otherwise be eligible.

g) Death Benefits

Salary benefit

Death while active:

A participant who dies during active service receives a lump sum benefit equal to the last salary at the date of death.

Eligibility:

- Amount:

Surviving spouses of retired members receiving a benefit will receive a life annuity equal to 30% of the annual pension payable to the member at the time of death.

Employees hired before January 1, 1993 are assumed to contribute 9.06% of salary [REDACTED]
[REDACTED]. Employees hired on or after
January 1, 1993 are assumed to contribute 11.0% of salary [REDACTED]
[REDACTED]

Contributions are refunded as follows:

- [REDACTED]
- [REDACTED]

1. *Journal of the American Medical Association*, 2000; 283: 2686-2692.

Increases are assumed to be granted automatically every three years as follows:

- 8% on monthly pensions up to \$300
- 4% for monthly pensions on the next \$300
- 2% of the monthly pension in excess of \$600

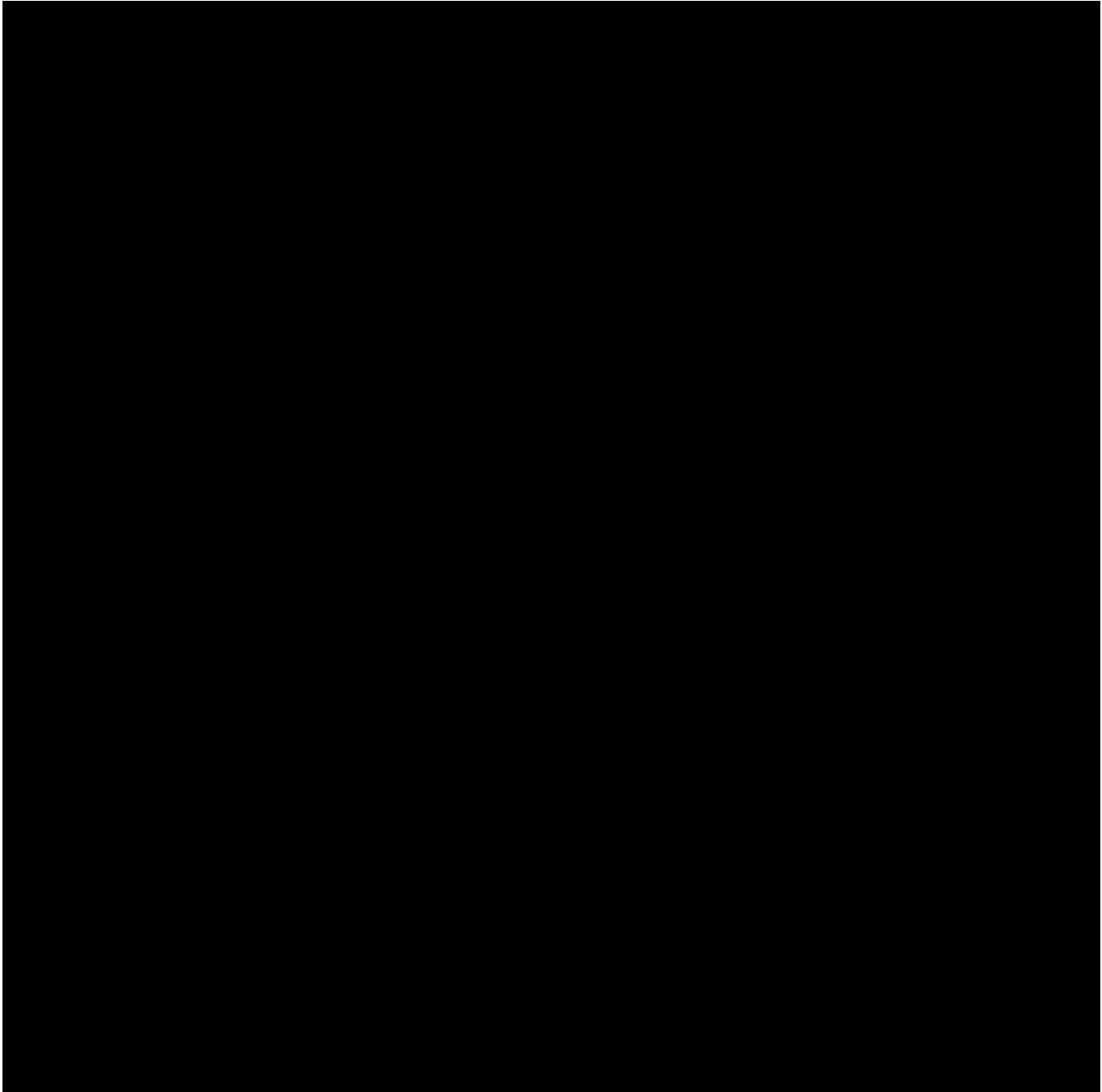
The minimum monthly increase is \$25 and the maximum monthly increase is \$50.

j) Additional benefits

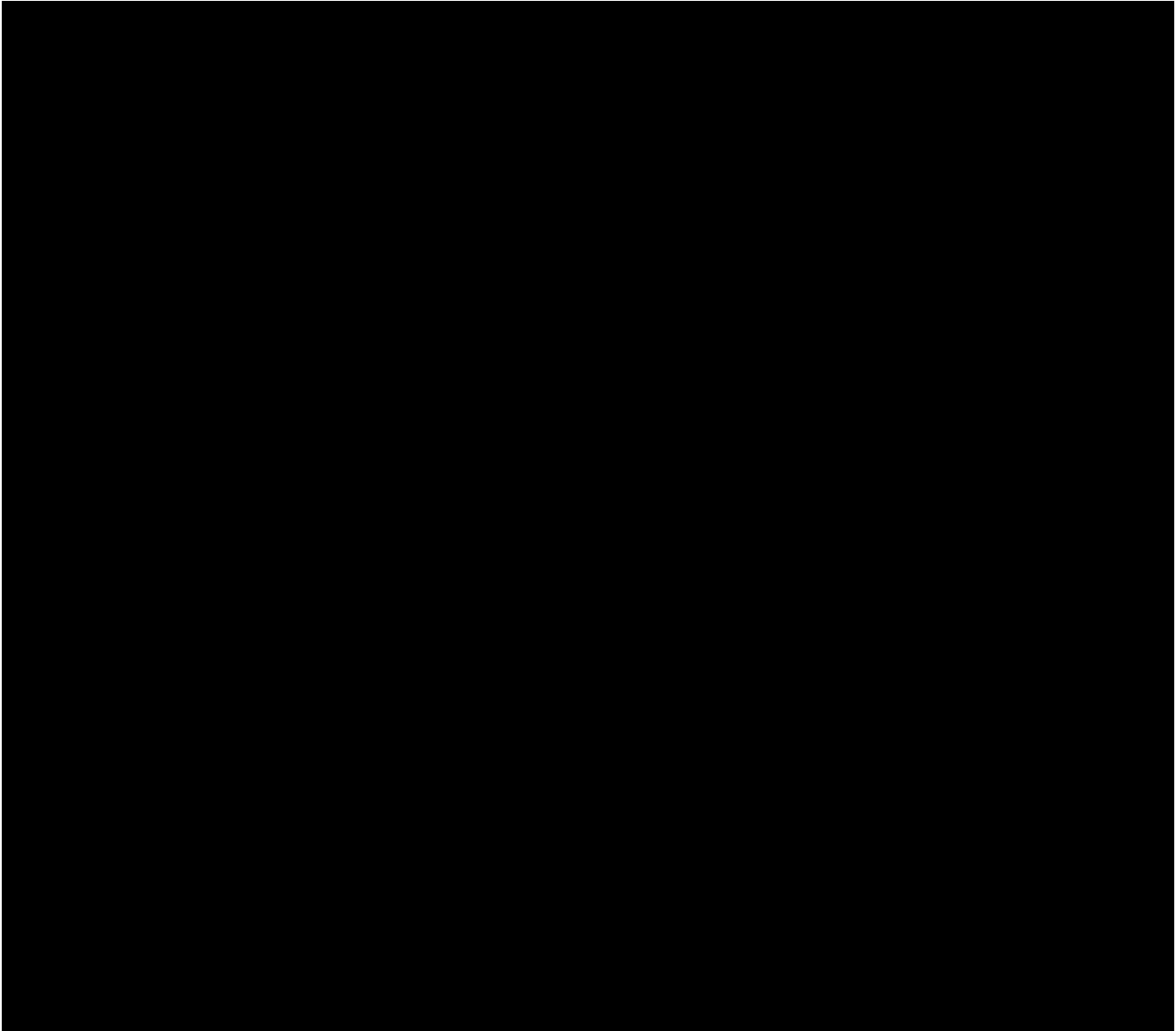
Christmas bonus: an annual Christmas bonus of \$400 is payable to all current and future retirees and beneficiaries.

Summer bonus: an annual summer bonus of \$100 is payable to all current and future retirees and beneficiaries.

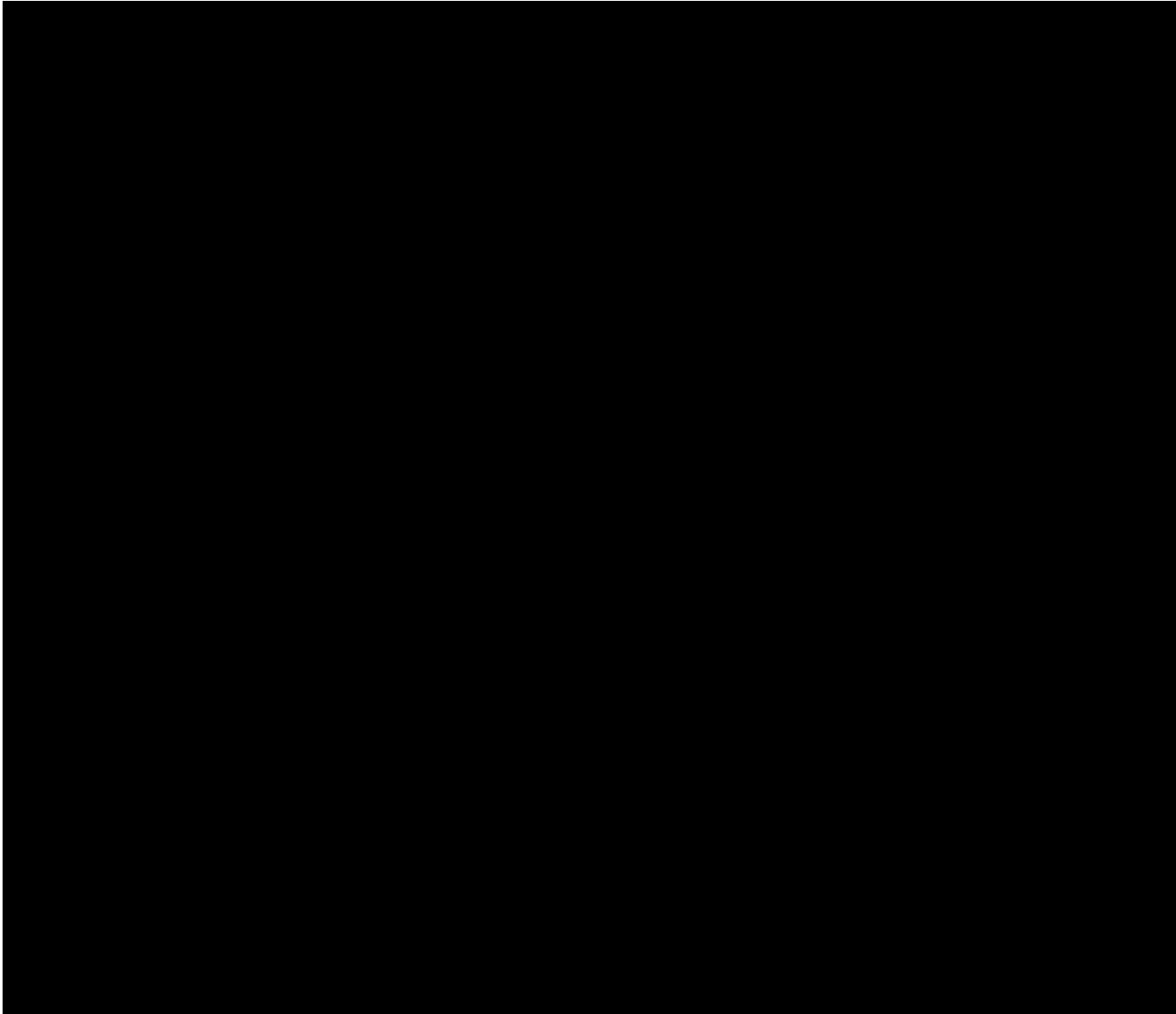
Funeral benefits: a lump sum benefit of \$1,000 is payable upon death to all current and future retirees.



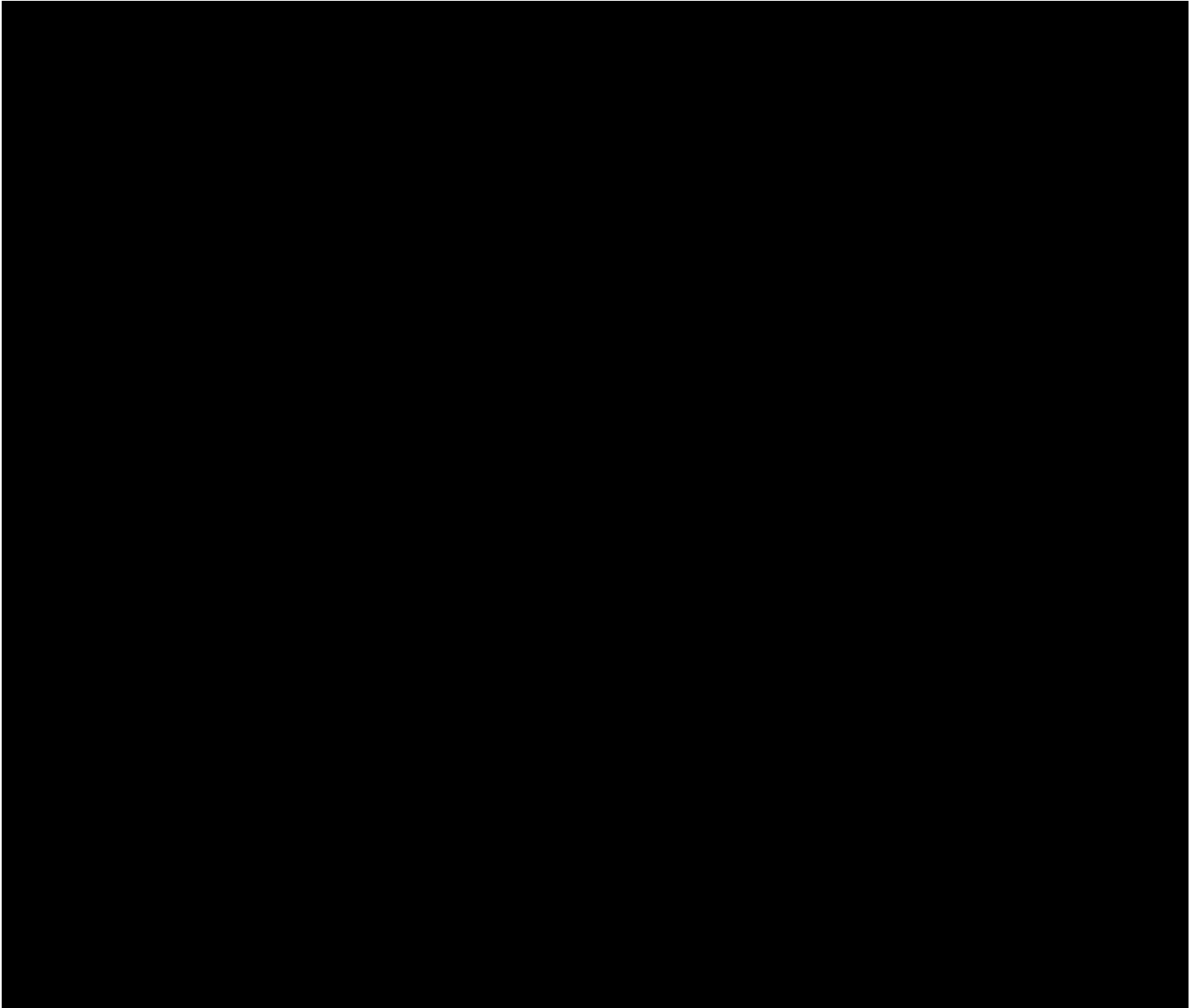
Results	
Discount rate	3.58%
PV of Employer Contribs	3,548



Results	
Discount rate	3.58%
PV of Employer Contribs	3,461



Results	
Discount rate	5.45%
PV of Employer Contribs	2,915



Results	
Discount rate	6.30%
PV of Employer Contribs	2,616

Appendix E: Development of a Reasonable and Appropriate Interest Rate Assumption

I relied on the Horizon Survey of Capital Market Assumptions, 2017 Edition (“2017 Horizon Survey”) for the capital market assumptions underlying the expected return on assets assumption. The Horizon Survey is a survey of 35 investment advisors who provided forward-looking, expected risk and returns for different asset classes in which pension plans commonly invest. It is a source widely referenced by the public and multiemployer pension plan communities. ERS itself references use of surveys from Horizon its audited financial statements.⁹⁴ I have reviewed the information contained in the 2017 Horizon Survey and determined that it is appropriate to use for the purpose of this assignment.

Developing My Expected Return Assumption

The expected return assumption depends on a plan’s asset allocation and should reflect a plan’s target asset allocation. The following target asset allocation for ERS was reported as of June 30, 2017 by Asset Consulting Group.⁹⁵

Target Asset Allocation and Capital Market Assumptions

Asset Class	Target Allocation (%)
US Large Cap Equity	22%
US Small/Mid Cap Equity	10%
Non US Equity	20%
Global Long/Short Equity	8%
Global Private Equity	5%
Core Bonds	30%
Core Real Estate	5%
Total	100%

The 2017 Audited Financial Statements show that the Non US Equity can be further subdivided into an allocation of 15% to International Developed Equity and 5% to Emerging Market Equity.⁹⁶

I used the 2017 Horizon Survey⁹⁷ to develop the expected return assumption for the ERS as of June 30, 2017, presuming an ongoing reference to the asset allocation shown above.

⁹⁴ PREPA Independent Auditors’ Report, Audited Financial Statements, Required Supplementary Information and Supplemental Schedules, for the year ended June 30, 2019, page 73.

⁹⁵ Asset Consulting Group, June 30, 2017.

⁹⁶ PREPA Independent Auditors’ Report, Audited Financial Statements, Required Supplementary Information and Supplemental Schedules, for the year ended June 30, 2017, page 51.

⁹⁷ See https://www.horizonactuarial.com/uploads/3/0/4/9/30499196/horizon_cma_survey_2017_v0822.pdf, accessed on April 21, 2023.

This survey of 35 different investment advisors gathers information on the key inputs into their own capital markets modeling, including expected returns by asset class, standard deviations by asset class, and asset return correlation relationships. The relevant assumptions from the 2017 Horizon Survey are as follows:

Asset Class	10-Year Horizon Geometric Returns	Standard Deviation
US Large Cap Equity	6.46%	16.58%
US Small/Mid Cap Equity	6.90%	20.22%
Non US Equity: Developed Markets	6.99%	18.86%
Non US Equity: Emerging Markets	8.00%	25.42%
Global Private Equity	9.01%	21.98%
Core Bonds	3.24%	5.50%
Core Real Estate	6.18%	14.52%

The 2017 Horizon Survey did not show return expectations for [REDACTED]. I assumed that this asset class has the same characteristics as US Large Cap Equity.

Applying these assumptions as input to our capital market model (along with the associated correlation coefficients⁹⁸), and using the ERS asset allocation described above, these return expectations emerge from the model:

	Arithmetic Return	Geometric Return	Standard Deviation
ERS Portfolio	6.95%	6.30% ⁹⁹	11.82%

The assumption of 6.30% is the median expected return of the expected return distribution given the portfolio above and the assumptions contained within the 2017 Horizon Survey.

⁹⁸ See 2017 Horizon Survey, page 13.

⁹⁹ Formula: $(1 + 6.95\%) \times (1 + 11.82\% \wedge 2 / ((1 + 6.95\%) \wedge 2)) \wedge -0.5 - 1]$

Appendix F: Development of Reasonable and Appropriate Recovery Cash Flows

Methodology

The recovery scenario modeled is based on analyzing the benefits earned through June 30, 2017 but payable according to the provisions of the Plan of Adjustment as stated in the Disclosure Statement. The provisions generally call for a change in the benefits eligibility for active members and a change in the pension increase for retirees effective upon confirmation of the Plan of Adjustment (which is assumed to be June 30, 2023 in the modeling). These provisions are described in Exhibit G of the March 1, 2023 Disclosure Statement.

Assets

Projecting Assets to June 30, 2022

The following are the steps to develop the starting assets as of June 30, 2022:

Item	Description	Value (\$ millions)
1	March 30, 2022 assets ¹⁰⁰	\$538.6
2	Expected PREPA contributions April 1, 2022 – June 30, 2022	■
3	Expected Benefit payments April 1, 2022 – June 30, 2022 ¹⁰¹	■
4	June 30, 2022 assets (1) + (2) + (3)	■

The investment return from March 30, 2022 to June 30, 2022 was not available. Any investment return between March 30, 2022 and June 30, 2022 will impact the figures above.

Accounting for Member Contributions with Interest

The assets above are assumed to include employee contributions since June 30, 2017 which in principle are designated to fund benefit accruals after June 30, 2017. Because the perspective of the recovery is to analyze “the recovery of the claim,” both post-June 30, 2017 pension accruals and member contributions have been excluded.

¹⁰⁰ Exhibit 70 of the 2022 Certified Fiscal Plan for the Puerto Rico Electric Power Authority As certified by the Financial Oversight and Management Board for Puerto Rico on June 28, 2022

¹⁰¹ Ibid, Three times the monthly amount.

The following member contributions were published in the 2021 Audited Financial Statements.¹⁰²

Fiscal Year	Member Contributions (\$ millions)
2018	23.0
2019	18.2
2020	19.9

Actual Member Contributions were not provided for FY2021 and FY2022. They are developed as follows:

It is reported that PREPA had 1,185 employees as of June 30, 2021,¹⁰³ down from 5,441 as of June 30, 2020.¹⁰⁴ Given that $1,185 / 5,441 = 21.8\%$, it is assumed that the FY2021 member contributions were 21.8% of the FY2020 level, or \$4.3 million.

The member contributions are also assumed to be \$4.3 million for FY2022.

The following then represents the total Member Contributions that are assumed to exist in the expected June 30, 2022 assets.

Fiscal Year	Member Contributions (\$ millions)
2018	23.0
2019	18.2
2020	19.9
2021	4.3
2022	4.3
Total	69.7

Investment returns for FY2018 and FY2019 were reported to be 8.12% and 4.42% respectively.¹⁰⁵ Investment returns for FY2020 -FY2022 were not available. Accounting for the known returns and assuming mid-year cash flows, the total Member Contributions with Interest as of June 30, 2022 is estimated to be \$72.1 million. Any investment returns in Fiscal Years 2020 – Fiscal Year 2022 will impact the Member Contributions with Interest.

¹⁰² Puerto Rico Electric Power Authority (A Component Unit of the Commonwealth of Puerto Rico) Audited Basic Financial Statements and Required Supplementary Information For the fiscal year ended June 30, 2021, Page 129.

¹⁰³ Ibid, Page 66.

¹⁰⁴ Ibid, Page 69.

¹⁰⁵ Employees' Retirement System of Puerto Rico Electric Power Authority Report on the Seventy-Fourth Actuarial Valuation As of June 30, 2019, Page 5.

Therefore, the Plan Assets as of June 30, 2022 are calculated as follows:

Item	Description	Value (\$ millions)
1	Estimated June 30, 2022 assets	\$478.6
2	Member Contributions with Interest	72.1
3	Estimated Net June 30, 2022 Assets (1) – (2)	406.5

Therefore, the Estimated Net June 30, 2022 Assets are \$406.5 million.

Illiquid Assets as of March 31, 2022 and June 30, 2022

The Illiquid Assets are reported to be \$156.0 million as of March 31, 2022.¹⁰⁶ The reported value as of June 30, 2022 was not available, so it was assumed that the value remained at \$156.0 million as of June 30, 2022.

The Illiquid Assets from the Oversight Board's PREPA Pension Claim and Recovery Analysis are assumed to be [REDACTED] as of June 30, 2023.¹⁰⁷

Summary of Assets

The following is a summary of the estimated assets as of June 30, 2022.

Item	Description	Value (\$ millions)
1	Total Assets	406.5
2	Illiquid Assets as of June 30, 2022	156.0
3	Liquid Assets as of June 30, 2022 [(1) – (2)]	250.5

Assumed Investment Returns

No investment return is assumed for Fiscal Year 2023. Any investment returns between July 1, 2022 and June 30, 2023 will impact the analysis.

Investment returns for the PREPA PayGo Trust are assumed to be [REDACTED]¹⁰⁸

The Illiquid Assets are assumed to be paid down at a rate of 5% per year perpetually. No interest assumption was disclosed by the Oversight Board's PREPA Pension Claim and

¹⁰⁶ Exhibit 70 of the 2022 Certified Fiscal Plan for the Puerto Rico Electric Power Authority As certified by the Financial Oversight and Management Board for Puerto Rico on June 28, 2022

¹⁰⁷ PREPA Pension Claim and Recovery, Appendix B.

¹⁰⁸ PREPA Pension Claim and Recovery, Appendix B.

Recovery analysis.¹⁰⁹ In the Recovery I explicitly assume that Illiquid Assets each 6.24% per year, consistent with their return over the last 5 years, and slightly below the return over the last ten years.¹¹⁰

Administrative fee load

Consistent with the PREPA Pension Claim and Recovery, Administrative fee load is of benefit payments.¹¹¹

PREPA Contributions

PREPA Contributions Fiscal Years 2018 – 2023

Consistent with the PREPA Pension Claim and Recovery, the following PREPA contributions were used for Fiscal Years 2018 to 2023¹¹²:

Fiscal Year	Amount (\$ millions)
2018	
2019	
2020	
2021	
2022	
2023	

PREPA Contributions Fiscal Years 2024 – 2059

PREPA contributions for Fiscal Years 2024 to 2059 are set each year such that 4 months' worth of benefit payments remain in the plan assets at the end of each fiscal year.

¹⁰⁹ Ibid.

¹¹⁰ Asset Consulting Group, June 30, 2022 report.

¹¹¹ PREPA Pension Claim and Recovery, Appendix B.

¹¹² Ibid, Claim and Recovery as described in Appendix E.

Forecasting of Benefit Payments

Active census forecasting

Benefit payments have been forecasted based on the June 30, 2017 census data file. Additional decrements have been applied such that the active population reaches the following sizes each year:

Valuation Date	Active Headcount
June 30, 2017	■
June 30, 2018	■
June 30, 2019	■
June 30, 2020	■
June 30, 2021	■
June 30, 2022	■
June 30, 2023	■

Given that the perspective is to focus on the “Recovery of the Claim,” no new entrants were included, and no benefit accruals after June 30, 2017 were included.

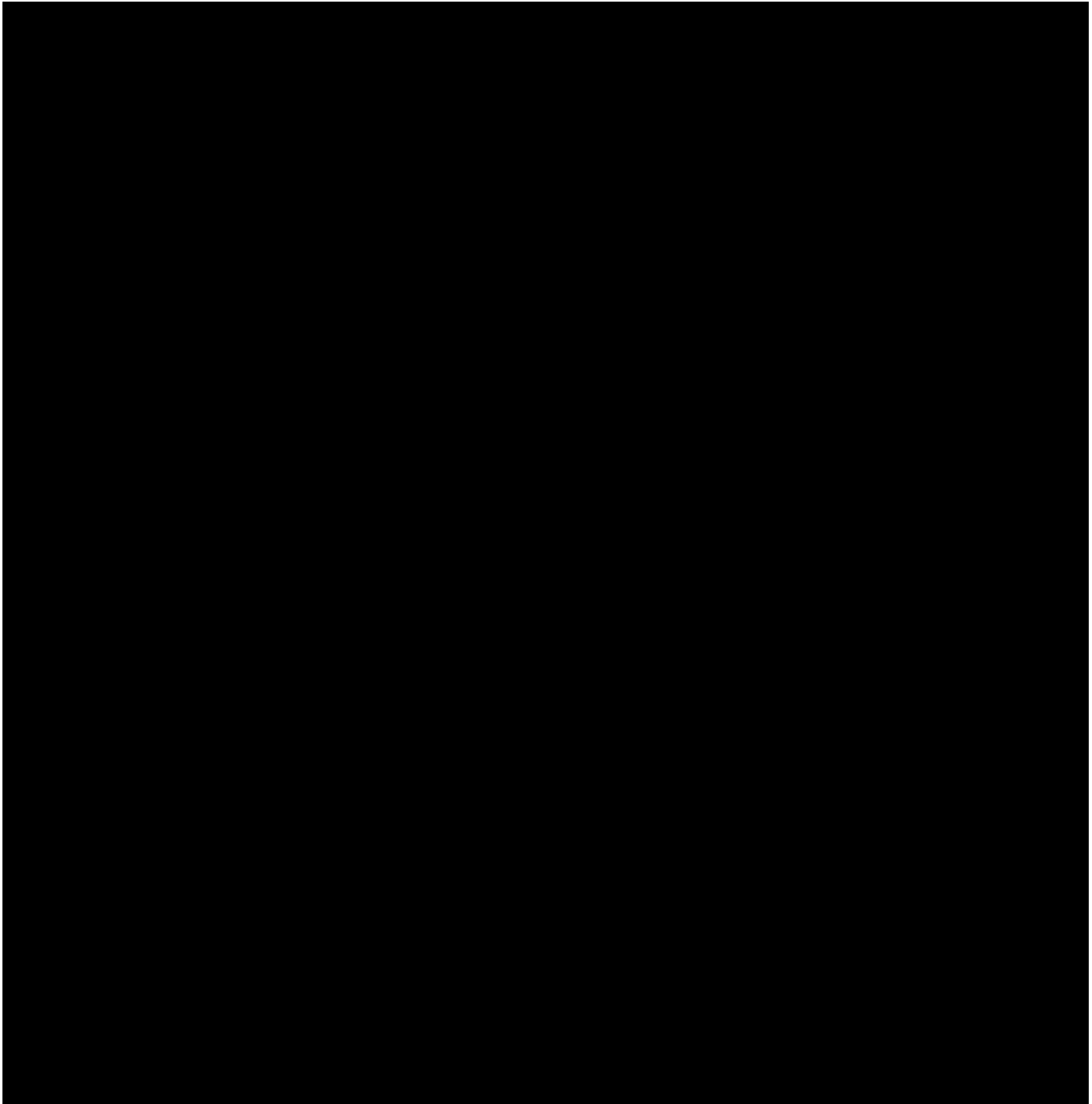
Active benefit modeling

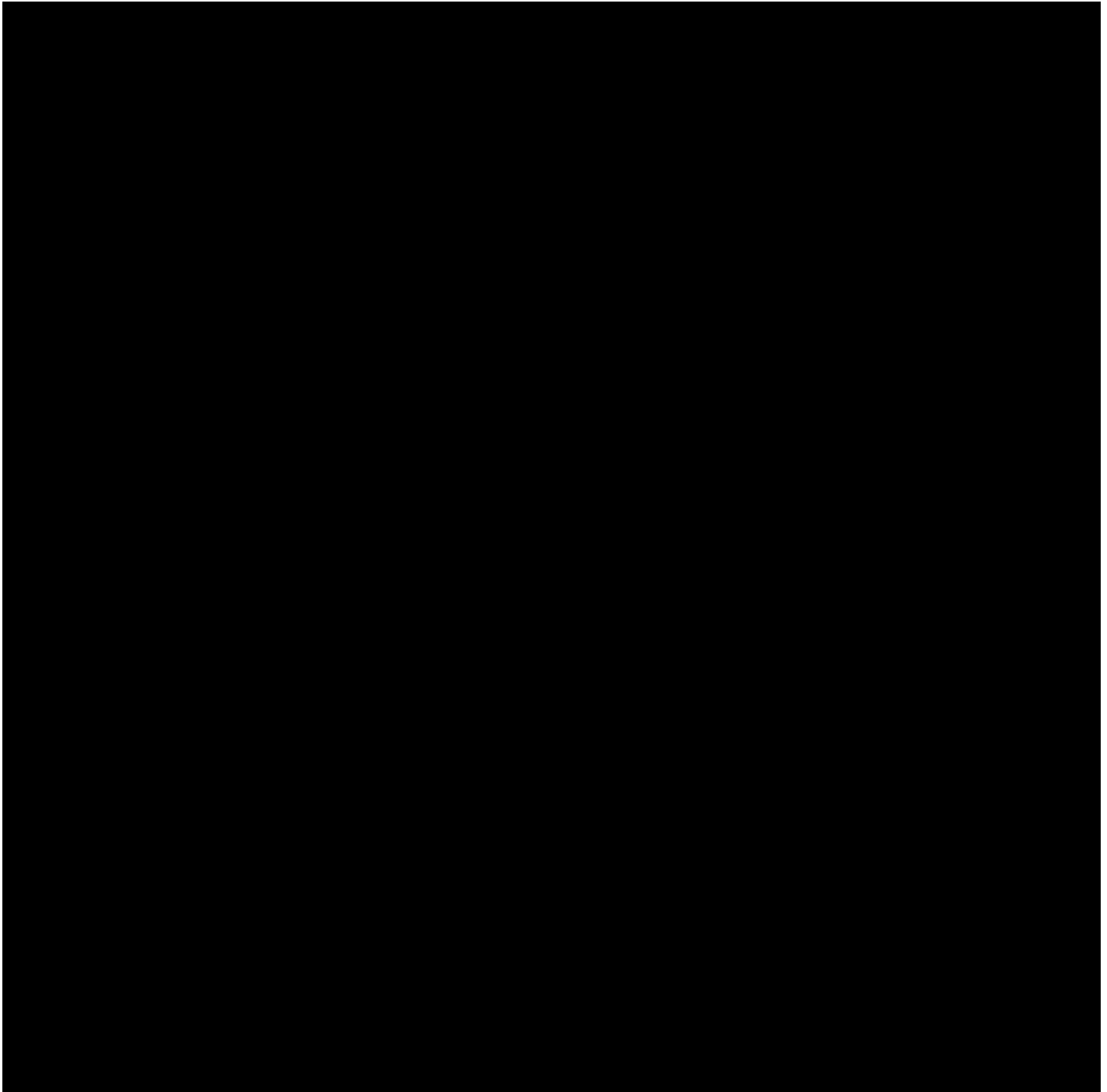
Active benefits were assumed to match the pre-Disclosure Statement plan provisions through June 30, 2023. At June 30, 2023 benefit changes were made according to Schedule G – Summary of Pension Reform as attached to the Disclosure Statement for Modified Second Amended Title III Plan of Adjustment.

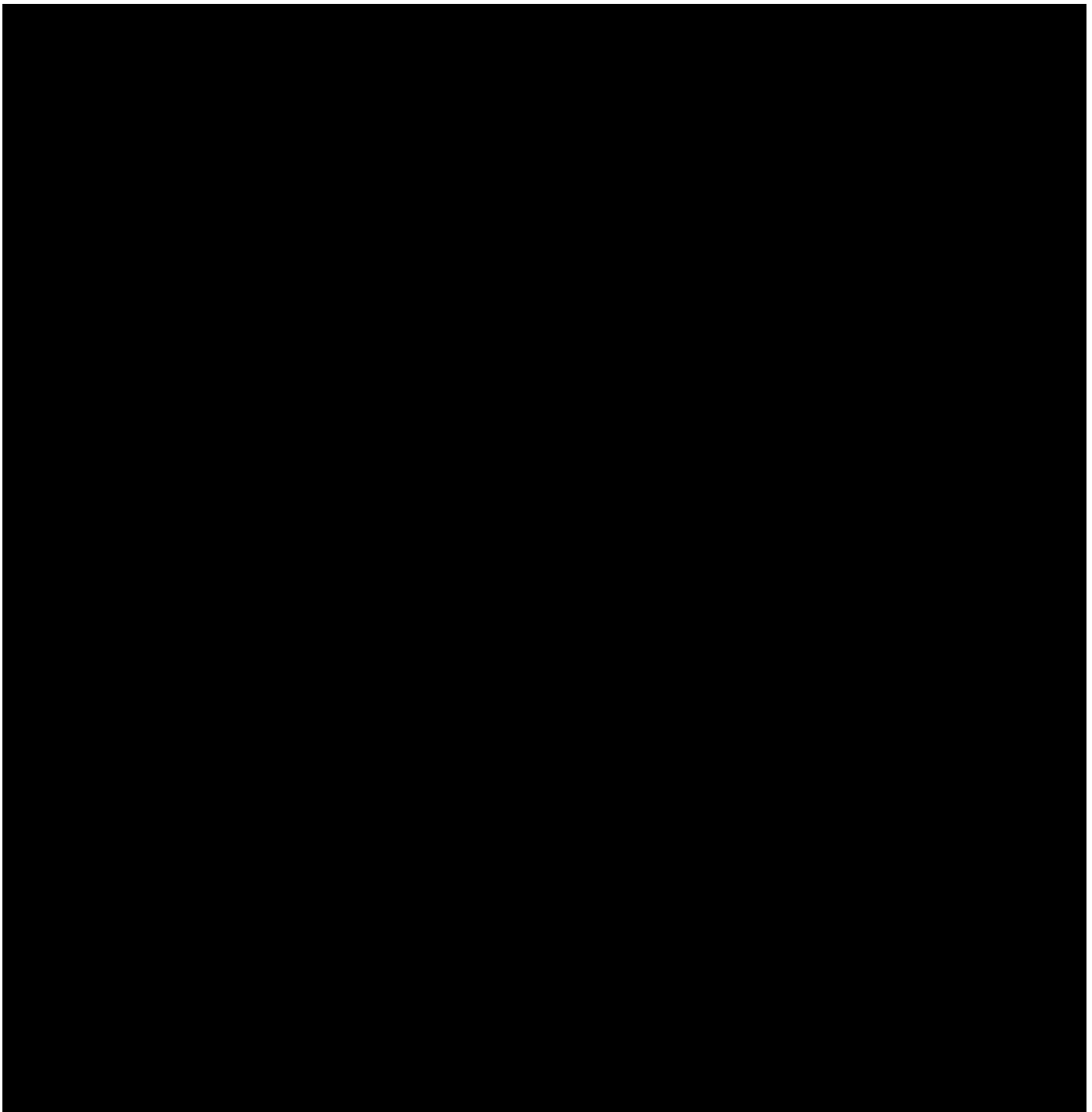
Retiree forecasting

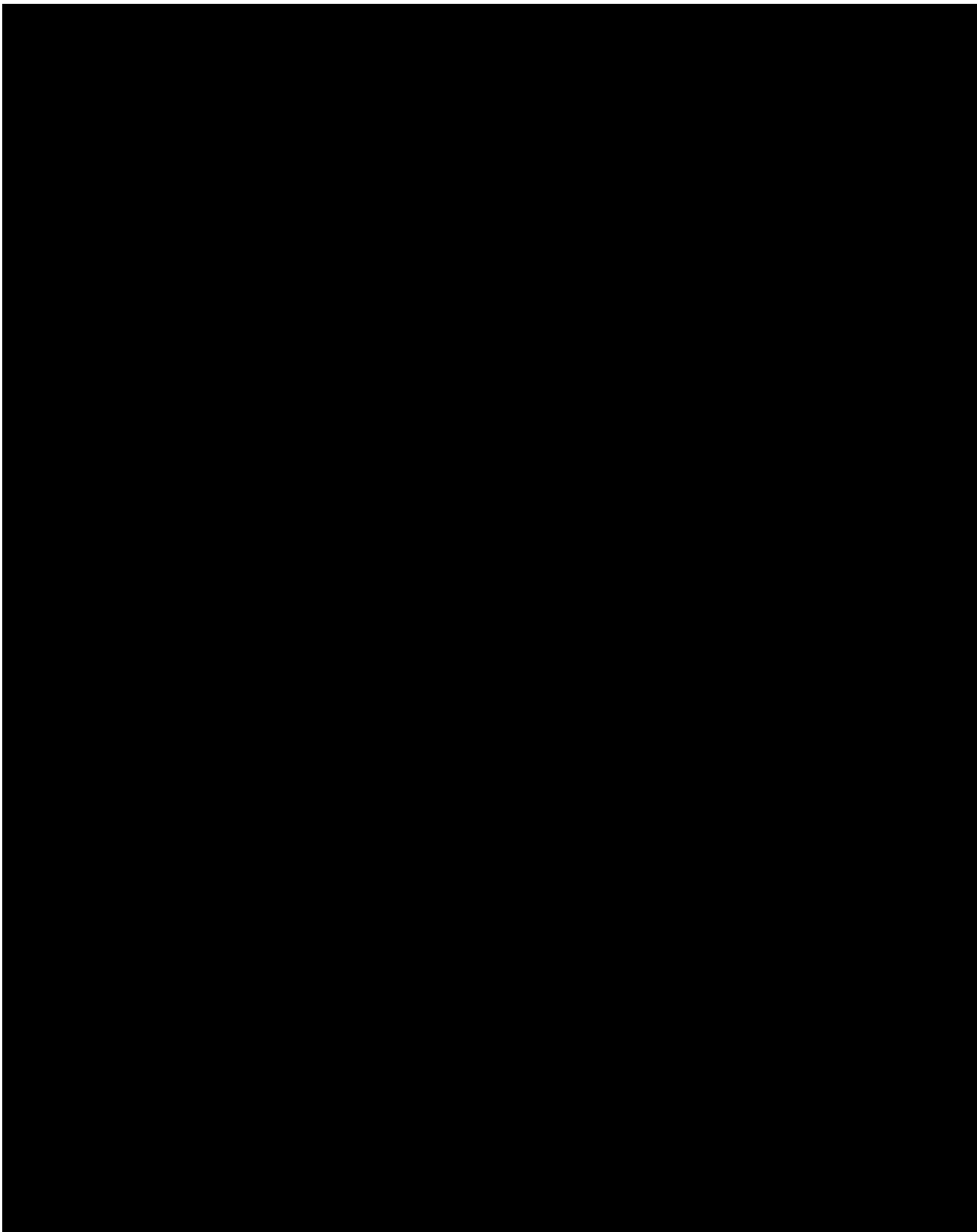
Retiree benefits were forecasted using the June 30, 2017 census data files. Pension increases for fiscal year 2018 were assumed to be included in the census data. Five pension increases were applied at fiscal year-end dates 2018 through 2022. No pension increases were applied starting on June 30, 2023 and beyond.

Projections









Appendix H: Reliance on Models

This appendix describes our reliance on both external (to The Terry Group) actuarial software as well as internally developed models in developing the actuarial findings central to the opinions offered in this report.¹¹³

The Terry Group uses ProVal, a third-party software program, to assist with actuarial valuations and projections related to pension plans. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the specified funding methods.

The output from ProVal is used as input to internally developed models, usually developed using Microsoft Excel, that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate various actuarial findings upon which my opinions are based.

The Terry Group has an extensive review process in which the results of the liability calculations are checked using detailed sample life output. Significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. The Terry Group also reviews ProVal when significant software changes or upgrades are made. This review is performed by experts within The Terry Group who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed.

¹¹³ Actuarial Standard of Practice No. 56, Modeling, provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Our use of models in developing the actuarial findings supporting the opinions offered in this report is in compliance with the guidance provided in ASOP no. 56.